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MAY 1988

VOLUME 6
NUMBER 5

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October 27, 1987

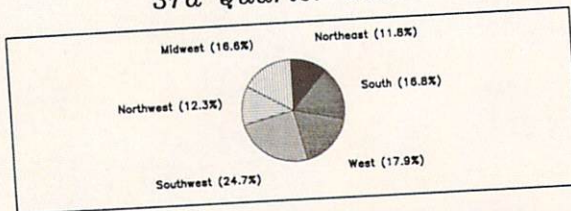
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Your hard work during the past few months has resulted in the most successful 3-month sales period in the history of Progressive Office Supplies. All six regions increased sales over the previous 3-month period, with the Southwest Region posting record sales of \$117,282.12, representing almost 25% of our total 3rd Quarter sales.

3rd Quarter Sales



As anticipated, the sales of typewriter supplies have continued to decline. This has, however, been more than offset by the increased sales of computer supplies, as reflected in the table below:

	April	May	June	TOTALS
Copier Supplies	\$27,101.22	\$24,456.65	\$33,140.97	\$84,698.84
Computer Supplies	\$36,387.26	\$45,776.13	\$44,600.59	\$126,763.98
Typewriter Supplies	\$42,735.40	\$45,688.66	\$40,214.73	\$128,638.79
Mailroom Supplies	\$45,122.10	\$42,678.40	\$47,603.15	\$135,403.65
TOTAL SALES	\$151,345.98	\$158,599.84	\$165,559.44	\$475,505.26

Again, congratulations to you for such a strong 3rd Quarter. I look forward to thanking you in person at the sales meeting next month in Hawaii.

Sincerely,

Frank Addison
President

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TER SALES GROUP, MONTH AND REGION

	APRIL	MAY	JUNE	REGIONAL SUBTOTALS
Midwest	\$3,781.31	\$3,738.00	\$4,853.70	\$12,373.01
Northwest	\$4,424.59	\$3,985.05	\$4,885.74	\$13,295.38
Southwest	\$4,498.20	\$4,211.85	\$5,482.26	\$14,192.31
West	\$6,323.99	\$4,567.85	\$7,834.23	\$18,726.07
South	\$3,668.35	\$4,049.85	\$5,018.58	\$12,936.78
Northeast	\$1,204.78	\$3,904.05	\$5,066.46	\$13,175.29
TOTALS	101.22	\$24,456.65	\$33,140.97	\$84,698.84
Midwest	\$15.89	\$3,728.40	\$2,550.20	\$8,394.49
Northwest	\$6.21	\$7,173.09	\$7,600.04	\$20,759.34
Southwest	\$5.80	\$7,581.33	\$8,527.96	\$22,195.09
West	\$1.88	\$12,976.29	\$10,234.55	\$34,487.72
South	\$65	\$7,289.73	\$7,806.68	\$20,330.06
Northeast	\$83	\$7,027.29	\$7,881.16	\$20,597.28
TOTALS	16	\$45,776.13	\$44,600.59	\$126,763.98
Midwest	\$3,977.60	\$4,201.95	\$12,630.02	\$21,229.48
Northwest	\$7,438.76	\$6,242.89	\$7,005.11	\$22,540.63
Southwest	\$7,862.12	\$12,878.34	\$3,412.63	\$37,733.13
West	\$13,562.90	\$12,878.34	\$3,412.63	\$37,733.13
South	\$5,559.72	\$3,412.63	\$6,473.01	\$20,934.23
Northeast	\$7,287.56	\$3,412.63	\$6,473.01	\$20,934.23
TOTALS	\$45,688.66	\$40,214.73	\$128,638.79	
Midwest	\$7,476.00	\$8,359.15	\$22,730.48	\$38,565.63
Northwest	\$7,970.13	\$8,412.56	\$24,451.06	\$40,833.75
Southwest	\$8,423.79	\$9,441.67	\$24,451.06	\$42,316.52
West	\$7,900.56	\$9,441.67	\$24,451.06	\$41,793.29
South	\$3,099.96	\$8,222.22	\$24,451.06	\$35,773.24
Northeast	\$7,287.56	\$3,412.63	\$6,473.01	\$20,934.23

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December 15, 1987

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software

Manufacturer:
Model:
Required Systems:

Microsoft Corporation
Microsoft Works
Apple Macintosh, Macintosh Plus, Macintosh II,
IBM PC, PS/2 or Compatible

Standard accessories

Word processing:

Font support

Spreadsheet:

Mailing labels
More than 50 functions
At least 256 by 4,096 cells

Database:

Form and list views
Calculated database fields
VT 52/100 terminal emulation

Import/Export:

Xmodem support
Other word processing files

Help:

Context-sensitive help

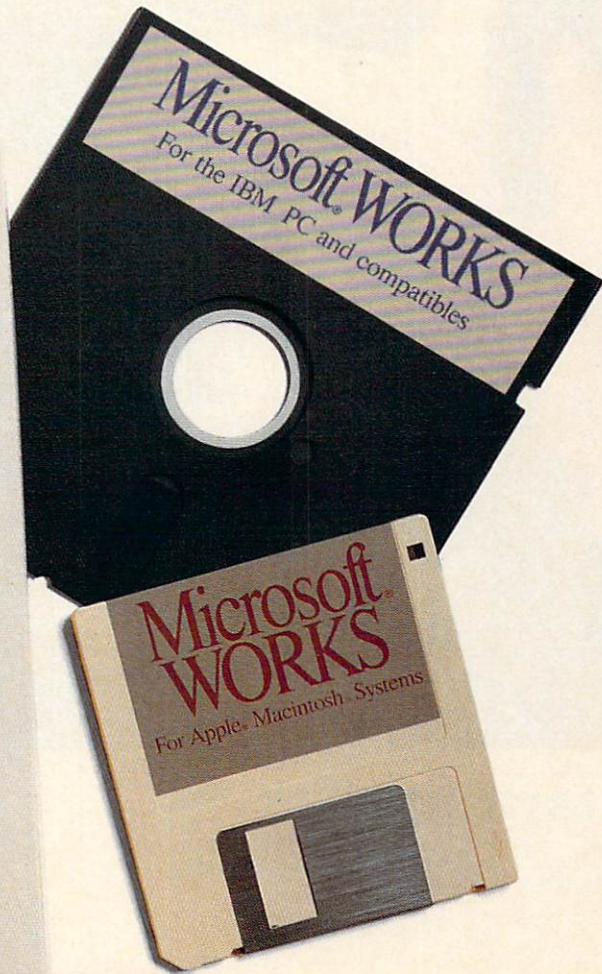
Integration:

- On-line tutorial
- Multiple files open simultaneously
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List price:

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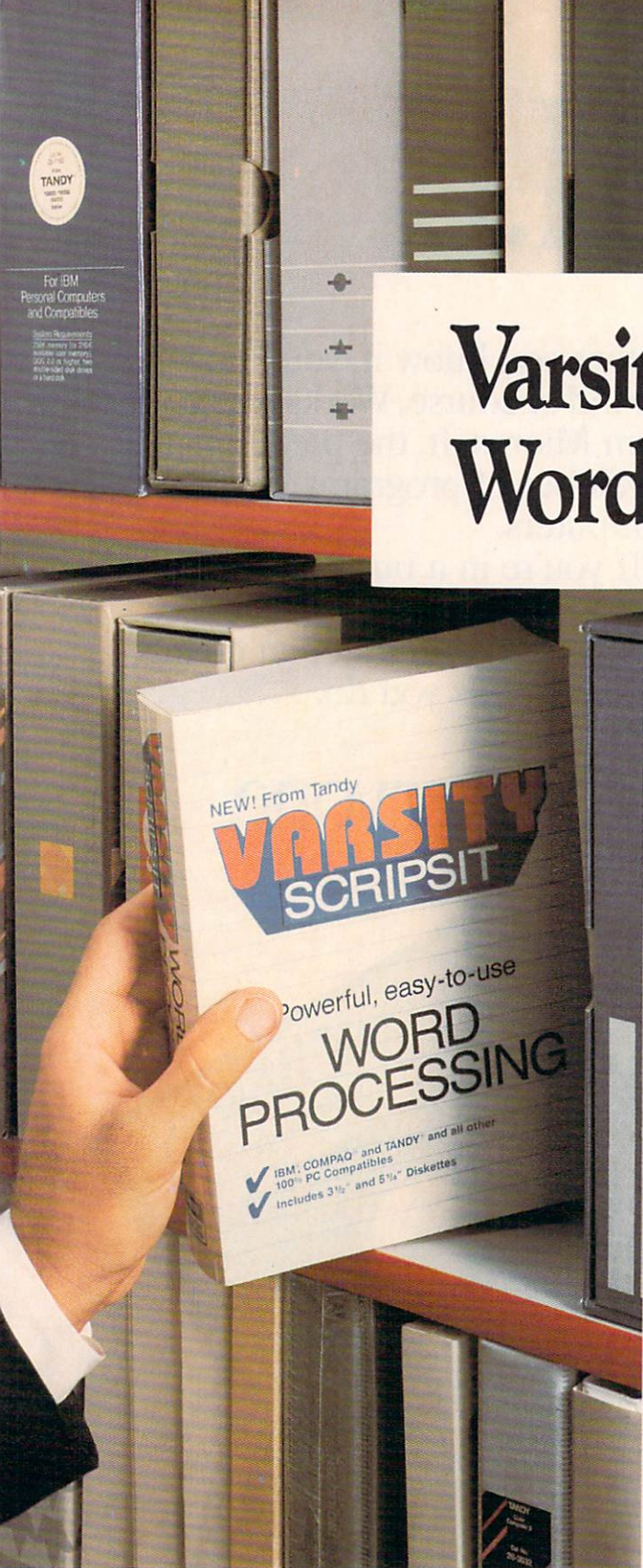
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FAMILY & HOME OFFICE COMPUTING

COVER STORY

39 20 BUILDING BLOCKS FOR A SUCCESSFUL HOME BUSINESS

Launch your business on a solid footing—here's a checklist that will help you leap dozens of marketing, legal, and financial hurdles on your way to a successful start-up.

NEW! TIP SHEET

55 MAIL-ORDER BUYING GUIDE

Take advantage of computer bargains-by-mail and minimize your risk. These tip sheets include important questions to ask before you buy; advice from seasoned experts; 10 early warning signs; and your consumer rights.

THE OFFICE AT HOME

8 HOME-OFFICE SHOPTALK
This month, Joanne Pratt advises an aspiring novelist; the owner of a word-processing business; a moonlighting tax preparer; and an engineer.

46 HOME-BASED FRANCHISES

Consider the benefits of buying a ready-made franchise—the investment can be minimal, and the path to profit shorter than in a start-from-scratch operation.

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BUYER'S GUIDE

49 POPULAR MONITORS AND DISPLAY CARDS

Upgrading to better graphics or color on your MS-DOS system? This guide to the complex world of EGA, CGA, and VGA helps you pick the right monitor and compatible display card. Includes cost-comparison charts, a graphics Q&A, and a glossary.

FINANCE

10 INSURANCE FOR YOUR HOME BUSINESS: PART 2

Protect your home-based business *before* disaster strikes—you'll need special coverage for such essentials as commercial liability, health, disability, and employee compensation.

TELECOMPUTING

14 ON-LINE SHOPPING WE WILL GO . . .

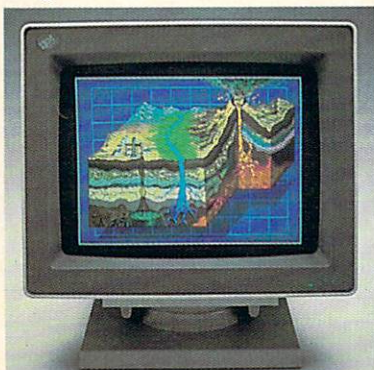
Avoid crowds and access bargains at all hours—at the on-line mall. Includes a sampling of electronic shopping services and connect-time costs on the major networks.

ENTERTAINMENT

28 HINTS, NEWS, AND NEW GAME FORMATS

This month, an international lineup includes the fascinating *Tetris* from the USSR; *Zig-Zag* from the UK; and *Intrigue* from the USA. Plus, the scoop on new games by Brian Fargo and Chris Crawford and new formats for *Space Quest II* and *Tower of Myrarglen*.

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APPLICATIONS & UTILITIES

59 MAKING FINANCIAL DECISIONS WITH A SPREADSHEET

Make the most of your spreadsheet's inherent mathematical powers. A hands-on mini-tutorial that demonstrates how to most effectively lend and borrow money.

PRODUCT REVIEWS

62 HARDWARE

Farallon Computing's MacRecorder sound digitizer; the Videowriter 450 from Magnavox; the Microsoft Mouse; Star Micronics's NB24-10 printer; and Toshiba's 3100/20 portable computer.

SOFTWARE

SOFTWARE GUIDE & REVIEWS

Reviews of 24 programs for business & productivity, education & creativity, and entertainment.

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24 READING, THE KEY TO LIFELONG LEARNING

Help your children strengthen their reading skills—from ABC's to content comprehension to speed reading. PLUS: A list of proven packages.

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79 THE PROGRAMMER

News, book reviews, and updates for programmers. Plus this month's programs: *Flashcards* (Fun Learning) and *Bourrée* (Microtones).

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94 THE CLASSIFIEDS

FAMILY & HOME-OFFICE COMPUTING (ISSN 0738-6079) is published monthly by Scholastic Inc., 730 Broadway, New York, NY 10003. Subscriptions: in U.S., 12 issues for \$19.97; Canadian and U.S. possessions add \$6.00 per year for postage; Foreign residents add \$8.00 per year. Printed in U.S.A. Copyright © 1988 by Scholastic Inc. All rights reserved.

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COMPUTER GRAPHICS BY GARY ZAMCHICK. CREATED ON IBM PC COMPATIBLE (LEADING EDGE) USING LUMENA SOFTWARE

Page 46



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NEW RELEASES/UPDATES

- ☐ **BUSINESS 2**—Expressgraph business graphics. Chart your data and find trends. Color graphics req.
- ☒ **CAD 1a,b**—(2 disks) Fingerpaint 1.2 advanced painting and Altamira object oriented design. Color.
- ☒ **CAD 2a,b**—(2 disks) DanCad3d, an advanced 2D/3D drafting program w/animation. 640K, color.
- ☒ **COMM 2a,b**—(2 disks) Procomm 2.42, an excellent modem program with terminal emulation.
- ☐ **EDUCATION 3**—PC-Fastype 1.20 typing tutor, ideal for beginners and advanced students alike.
- ☒ **FINANCES 3a,b**—(2 disks) Express Calc 3.12, a powerful and user friendly spreadsheet program.
- ☐ **GAMES 8**—Striker helicopter attack and Risk, the game of world domination. Color required.
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- ☒ **LANGUAGE 3a,b**—(2 disks) The A86 3.09 macro assembler and debugger for 8088/86/286s.
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EDITOR'S NOTE

TAKING THAT EXTRA STEP (Or, How to Make Sure That Good Idea Works)

There are several effective ways to keep a good idea from working. One is just to never give it a try. A more subtle way is to try halfheartedly and then give up. By failing to think through our ideas and our plans to make them materialize, we miss taking the best road to giving a good idea a chance to succeed.

The number of businesses that go under each year constitutes a startling statistic. I'll bet that a large proportion of them are good ideas that failed, often because of a lack of advance planning. With the interest being shown today in becoming a home-based entrepreneur, frequently made possible because of a computer, we thought it important to help people increase the odds of succeeding in their favor. So, whether you're contemplating setting up a business at home, are already midstream, or are an old hand at bossing yourself around, you'll find it interesting—and important—to read this month's cover story, "20 Building Blocks for a Successful Home Business" (page 39) by Lis Fleming.

For the bold of spirit but meeker of heart, independence may lie in buying into a franchise, a safer road to self-employment than starting from scratch. Lynie Arden's article, "Home-Based Franchises" (page 46), a companion-piece to our cover story, chronicles the changing nature of franchise businesses from storefront to home-based, largely because of the change from a goods- to a service-based economy. And of course technology plays a large role in the changeover. If the franchise idea piques your curiosity, you'll be much better informed after reading Arden's rundown of several computer-



based franchises and her tips for evaluating a franchise.

Saving money is always a good idea, but too many of us are careless in trying to do so via mail-order buying. Another good idea that doesn't always get a chance. So some of us end up kissing our hard-earned dollars good-bye. If you're interested in saving money and are willing to take the time and care necessary to be successful doing so, our "Mail-Order Buying Guide" (page 55), by senior editor Bernadette Grey, is a must. In the form of tip sheets, a new format this issue, you'll find steps for doing your homework before ordering, questions to ask, trouble signs to watch for before sending off your money, and lots of other helpful advice. We'll be running more practical help in the form of tip sheets in future issues.

If you've become a follower of Joanne Pratt's "Home-Office Shop-Talk," note that it now has a new position in the front of the magazine (page 8). And don't hesitate to ask a question of your own. Pratt's sound advice is likely to help you and a lot of other readers as well.

Claudia Cohe
CLAUDIA COHE
EDITOR-IN-CHIEF

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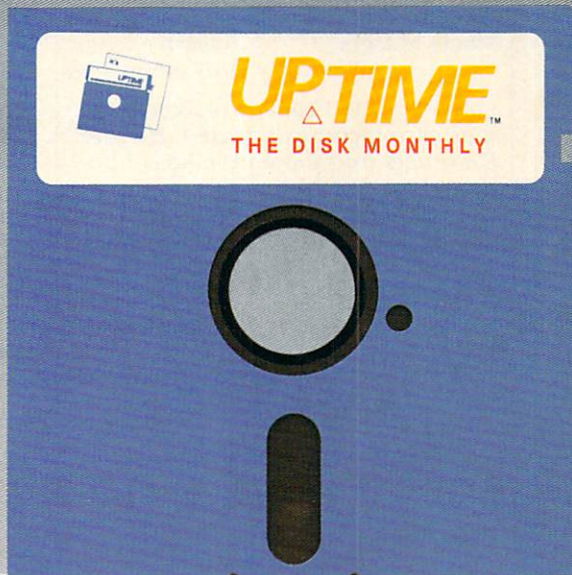
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LETTERS

APPLICATIONS ARTICLES HIT HOME

I read both parts of "Getting More from Spreadsheets and Databases," by Rob Krumm, in the December 1987 and January 1988 issues. I have enjoyed these greatly and found a lot of helpful information. I would like to see FAMILY & HOME-OFFICE COMPUTING continue with articles of this type.

PHILIP A. CARISTO
Santa Fe, New Mexico

EDITOR'S NOTE: Note Krumm's two-part word-processing series, which ran in February and March. He's back this issue with "Making Financial Decisions with a Spreadsheet" (page 59). Next month, he continues with more creative ways of using spreadsheets. Watch FAMILY & HOME-OFFICE COMPUTING for a steady flow of articles to help you streamline and improve database reporting, printing, page design, accounting, and other applications.

MORE ON MONOCHROME

As the owner of a Leading Edge Model D with Hercules-compatible graphics and a monochrome monitor, I can empathize with readers who commented on the limitations of monochrome systems such as mine (Letters, February).

Do you have any information to pass along to readers regarding Athena Video BIOS or Sim-CGA, a shareware program? Each claims to be the software solution to running CGA graphics on a monochrome monitor.

ANN M. PETTINGER
Idaho Falls, Idaho

EDITOR'S NOTE: Sim-CGA (Excelsior Software, 157 Dolson Ave., Middletown, NY 10947; [914] 343-5155; IBM PC; \$30-\$40) emulates CGA modes. Said company president Michael Ogrinz: "Sim-CGA is now 95-percent compatible with CGA and supports self-booting programs. It comes with an auto-patcher, and we provide free patches for any remaining compatibility problems. The shareware your reader mentioned is the original version, and substantial improvements have been made in the current release."

Athena Video BIOS (Athena Digital, 2351 College Station Rd., Suite 567, Athens, GA 30605; [404] 354-4522; IBM PC; \$40-\$60) also emulates CGA modes and offers extend-

ed BIOS to support the Hercules graphics mode. You can also use its PRT.SCR file to print Hercules and EGA screens that some versions of DOS won't let you print.

YEAGER'S ONE OF SEVERAL ACES

In "Playing with the Experts: Yeager, Madden, Weaver," on page 40 of the February issue, you mention that General Chuck Yeager is the "only man ever to shoot down five enemy planes in one day." According to *The Epic of Flight* (Time-Life Books), several World War II pilots recorded five or more victories in a single mission, including William Shomo, Stanley Vejtasa, David McCampbell, and the German ace, Hans Marseille.

I am not trying to detract from General Yeager's reputation, but "facts is facts."

DAVID P. CLARK
Worcester, Massachusetts

EDITOR'S NOTE: Yeager's involvement was also incorrectly stated. He and EA artists and programmers collaborated for one 15-hour session and consulted by phone and mail for one year.

BACK TO BUSINESS

In January's Telecomputing column, you referred to Lynie Arden's "Top 10 Computer-Based Home Businesses," which appeared in the June 1987 issue.

How can I obtain a back issue for a copy of this article? I am interested in using my computer to start a home business so I can stay home with my four young children.

CATHY FERRIER
Newark, Delaware

EDITOR'S NOTE: Another article you might find useful is "Women Who Juggle It All," on page 43 of the October 1987 issue.

You may obtain back issues by writing FAMILY & HOME-OFFICE COMPUTING, Back Issues, P.O. Box 717, Cooper Station, New York, NY 10276-0717, and enclosing \$4.25 for each issue, \$3.50 each for five to ten issues, or \$3.00 for more than ten. Be sure to request each issue by month and year.

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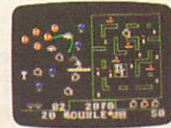
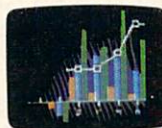
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HOME-OFFICE SHOPTALK

AN EXPERT'S ADVICE ON STARTING, RUNNING, AND OPERATING A HOME-BASED BUSINESS



**BY
JOANNE
H. PRATT**

Can't spell? Keep your shortcoming a secret by using a spelling checker (most word-processing programs have one).

I hate returning compliments with criticism, but I'm seeing too many misspelled words in the letters I receive, like the one from the gentleman who congratulates me for my "senssible advise" and wants to write recommendations for students applying to "collages."

Would you want to be represented by a bookkeeper who writes "accounts receivable," by an expert who wants to be "helpfull," or by any other professional who sends out misspelled letters in your name? There are many things that a computer cannot do for your business, but it can correct your spelling. Try a spelling checker—it will work wonders for your business credibility.

Q. I am a moonlighting tax preparer with about 50 clients. Last tax season, I used J. K. Lasser's tax-preparation software. Although it had limitations, it was helpful and made me realize the potential growth for my business—if supported with the right software. This is especially true because of all of the changes. I'd appreciate any suggestions or recommendations for a professional tax-preparation program that includes state tax modules.

ANGELA S. EISERT
Cedarhurst, New York

A. The professional version of Turbo Tax (IBM PC, \$295) offers many pluses to help build your business.

JOANNE H. PRATT, president of Joanne H. Pratt Associates, Dallas, Texas, has 28 years of experience in operating home-based businesses. Her business conducts research and consults for private and government clients.

The program has been thoroughly updated to include changes in the tax law. Most important, it includes additional IRS forms, worksheets, and client form letters. You can file all of your forms (including Form 1040) as dot-matrix or laser print-outs, or, as a professional tax preparer, you can file electronically.

Many state modules, including New York, New Jersey, and 26 other states, are available for \$195 each. Finally, Turbo Tax includes a tax planner for 1988 that you can begin using right away. Turbo Tax is available from ChipSoft Inc., 5045 Shoreham Place, #100, San Diego, CA 92122 ((619) 453-8722). The standard version is available for \$75, and state modules are \$40.

Q. I have a Leading Edge Model D computer. After 10 years of thinking about the type of home business I'd like to operate, I've found the answer. I've decided to fulfill a childhood dream and become a romance novelist. I have 2 years of word-processing experience but no writing experience. I've read romance novels for 20 years. I have a fantastic imagination and am a hopeless romantic.

Please tell me how to get started. I am completely ignorant on how to begin making this dream come true.

BEVERLY PETTY, address unavailable

A. Your address wasn't on your letter, so I don't know whether you live in a big city or a small town. But see if you can find a community college or some other continuing education program that offers a course in writing and selling books, particularly romance novels. This way you can develop your writing skills and learn how to market your stories.

You might also consult the *Writer's Market* (F & W Publications, Inc., 1507 Dana Ave., Cincinnati, OH 45207; \$22), an invaluable resource available at your public library or bookstore. For example, under "Book Publishers," you will find that Harlequin Books prints approximately 675 titles per year, culled from 10,000 submissions. Ten percent of the books published were written by first-time authors; 20 percent of that 10 percent were from

writers without agents.

Send self-addressed, stamped envelopes to your favorite publishers and ask for their stylesheets. It's very hard to secure an agent if you have no previous writing experience. So follow the stylesheets carefully, and submit your sizzling romance "over the transom."

Q. I am unable to locate the software called RESUME! mentioned in the November 1987 article "How to Start A Word-Processing Business." Would you please point me in the right direction?

HENRY STEVENS, Margate, Florida

A. RESUME! (\$50) is available from North American InfoNet, P.O. Box 750008, Petaluma, CA 94972 ((707) 765-1999). Available in IBM PC format, the program has an interactive database that allows you to tailor resumes, by chronological order, by accomplishment, and by targeting. You can also make variations in those templates.

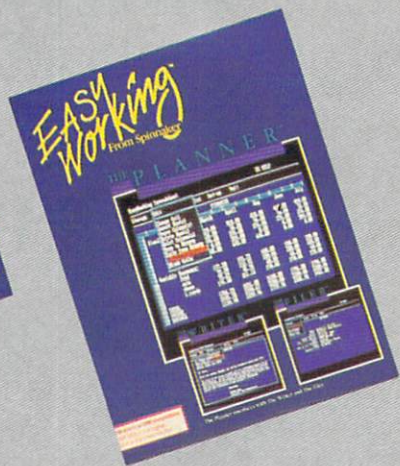
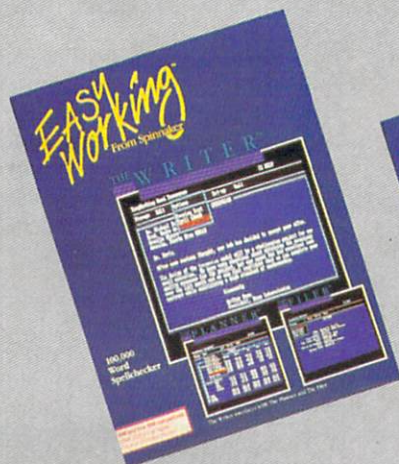
Q. In my 30 years as an engineer, I have been primarily involved in machinery and process maintenance and have found that most maintenance is reactive rather than preventive. However, there's great demand for preventive-maintenance programs. I can provide the required data and would like to find someone experienced or interested in computerizing preventive-maintenance programs.

H.L. VAN STONE, Evansville, Indiana

A. You're not alone in seeing the potential of computerizing maintenance records. *The Datapro Directory of Microcomputer Software* (Datapro Research Corp., 1805 Underwood Blvd., Delran, NJ 08075; [800] DATAPRO; \$717) lists more than a dozen preventive-maintenance programs in the Plant-Equipment Maintenance section. Consult the directory or contact the publisher for a list of the engineers and programmers who worked on the various programs. Perhaps you can locate someone in your area to help you complete your project. You might also consult the American Society of Mechanical Engineers for assistance. ■

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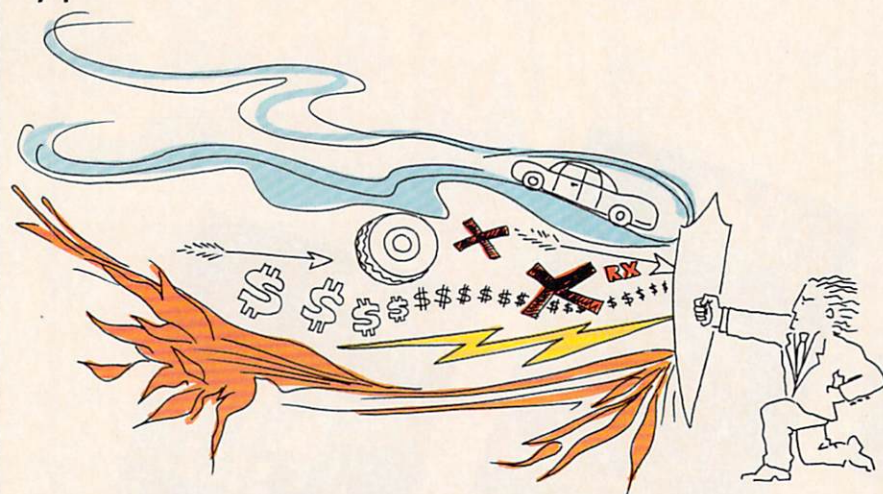
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FINANCE

INSURANCE FOR YOUR HOME BUSINESS: PART 2

Malpractice, Partnership, Disability, Health, and Other Types of Insurance You Should Consider **BY LIS FLEMING**



As I discussed in last month's "Insurance for Your Home Business, Part 1," homeowners' insurance policies often don't fulfill the needs of home-based businesses. For many operations, even riders and endorsements tacked onto homeowners' policies won't provide adequate protection against disasters, thefts, lawsuits, and the like. If your homeowner's insurance coverage falls short, you should look into policies that better guard your business and your employees. And, of course, *all* home-based business operators should consider disability and health insurance.

COMMERCIAL LIABILITY

Commercial liability is a blanket term for business insurance as opposed to personal insurance. Here are some forms of insurance intended specifically for businesses. Rates depend on such factors as where your business is located and the classification of the business.

- **Malpractice insurance**, which covers the failure to exercise an accepted degree of professional duty, can be expensive. Doctors aren't the only ones who need malpractice insurance; so do many other professionals, such as lawyers, accountants, and hairdressers.

One type of malpractice insurance

protects professionals, such as consultants and programmers, from errors and omissions. An insurance agent, for instance, would need this type of insurance to handle suits brought by clients for the omission of a clause that should have been included in a policy. Similar to standard malpractice coverage, errors and omissions insurance bears a high premium.

- **Business interruption insurance** guards against the loss of earnings, income, or rents if your business is interrupted by fire, vandalism, wind, or any of the 10 other perils listed in standard commercial policies. For instance, it covers the extra expense of setting up your business in temporary quarters and continuing expenses such as payroll and loan payments. Costs for this kind of insurance policy vary greatly, depending on the type and location of the business.

INSURING OTHERS

If other people are involved in your business—employees, customers, and partners, for example—you'll have to deal with other issues.

- **Worker's compensation** protects workers in case of injury on the job. Requirements vary from state to state, with some states, such as California, requiring it even for part-time workers. Other states demand it if you employ more than 10 people.

- **Non-owned auto insurance** covers injuries, damages, and losses sus-

tained by people who are performing business for you while using their own cars.

- **Partnership insurance** protects you from the actions and debts of your business partners. You're responsible for your partner in both formal and informal partnerships. Consider this insurance to protect yourself from lawsuits and consult an attorney to write a sound partnership agreement.

- **Employee benefit plans** (which typically include life, health, and disability insurance) will help you attract and keep valued employees. If you buy a group plan, you can include yourself in the coverage.

DISABILITY INSURANCE

If you are self-employed, you may need protection against temporary or permanent loss of income. Unfortunately, home-based business operators often have problems getting disability insurance because carriers find it difficult to determine "necessary" income for the self-employed. Waiting periods before coverage begins, length of time before payments will be made, definitions of what "disabled" means, and amounts of payments vary from policy to policy.

ORGANIZATIONS OFFERING GROUP INSURANCE

American Home Business Association, 397 Post Road, Darien, CT 06820; (800) 433-6361. Health, long-term disability, home/business property and liability. \$55 annual dues.

Independent Computer Consultants Association, 933 Garden View Office Pkwy., St. Louis, MO 63141; (314) 997-4633. Health, medical, long-term disability, life, dental, optical (group), error and omission (individual). \$160 membership for one-person company.

National Association for the Self-Employed, P.O. Box 61207, Dallas, TX 75261; (800) 433-8004. Health, prescription, dental, vision. \$48 annual dues.

National Association for Female Executives, 1041 Third Ave., New York, NY 10021; (212) 371-0740. Health, life. \$29 annual dues.

LIS FLEMING, a contributing editor, wrote part one of "Insurance for Your Home Business" in the April issue.

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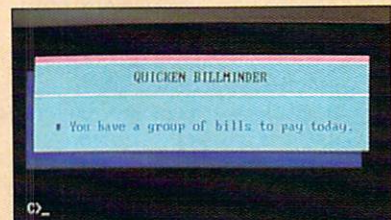
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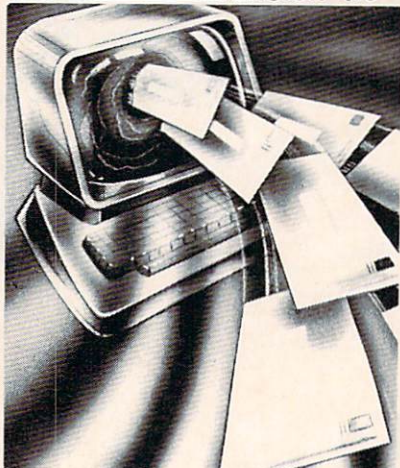
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HEALTH INSURANCE

As mentioned earlier, small-business operators should also consider health insurance for themselves and for their employees. It's probably a good idea to look into one of the group plans that are becoming available to smaller businesses. Preferred provider organizations (PPOs) and health maintenance organizations (HMOs) now provide good benefits at costs affordable to the individual.

You can insure yourself and/or your employees through various sources: 1) companies for which you provide services; 2) professional and trade organizations; 3) multiple employer trusts offered by insurance agents; or 4) your spouse's policy.

Be sure that the organization that sponsors your group plan has been established for a substantial period of time and has a large membership. One home-based business owner, who was covered by health insurance through a professional group, learned this lesson the hard way. When the group disbanded, the insurance was dropped. The carrier refused to continue the coverage on an individual basis, and the business owner couldn't get another health plan because of health problems.

fills a gap left by the large agencies that aren't geared to working with small businesses. Much of Cooper's time is spent educating businesspeople about insurance and showing them how they can spend less money on insurance coverage.

Here are insurance tips from Cooper:

1. Be an informed consumer. Check to see if your insurance carrier has an A or A+ rating in *Best's Insurance Reports*.
2. Select a good, competent agent who is willing to help you plan your present coverage with an eye to your future needs.
3. Keep abreast of industry changes.
4. Budget for insurance premiums so that you never have to let your policy lapse.
5. Introduce loss-control measures, such as improving your work methods and streamlining your techniques. Doing the job right and on time prevents expensive lawsuits.
6. Eliminate unnecessary coverage.
7. Carry higher deductibles.

And finally, Cooper suggests that you consider the alternatives to expensive insurance policies. Take steps to avoid trouble. Establish extra safety precautions, avoid high-risk jobs, write easy-to-understand contracts, and increase your quality control so that your work is always of the highest caliber possible. ■

FINAL WORDS OF ADVICE

Christine Cooper, an insurance broker in Sacramento, California,

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TELECOMPUTING

ON-LINE SHOPPING WE WILL GO, . . .

Access an On-Line Network to Shop, Browse for Bargains, or Just Have Fun!

BY STEPHANIE ESTERS

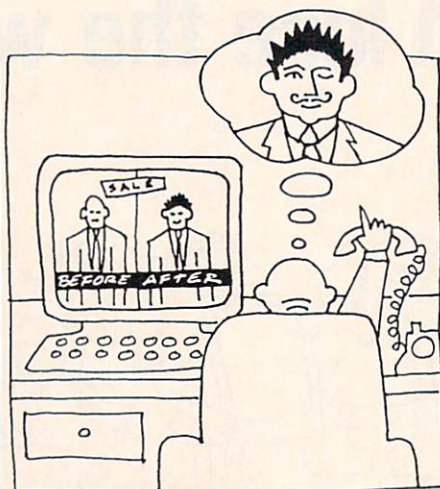
Tired of crowded malls, hovering salespeople, or that ever-elusive item that is sold out everywhere? Or just plain hungry for a bargain of any kind? Don't despair; try electronic shopping.

Electronic shopping refers to shopping or "browsing" in on-line databases that you can access through such networks as CompuServe and The Source. In the same way that you shop at stores in a mall, you can go on-line and browse or comparison shop at various department stores and specialty shops—minus the eye-catching window displays, of course. Descriptions of the items comprise three or four lines of on-screen text and are similar to item descriptions in a catalog.

From miniatures and dolls for hobbyists to electronics for tinkers, from Metropolitan Museum of Art reproductions for art enthusiasts to office furniture and accessories for home-office operators—you name it, you'll find it when you go shopping on-line. You'll also find fine garments and gourmet delights from such renowned companies as Brooks Brothers, Godiva Chocolates, or Hickory Farms or home appliances and stereo equipment from the likes of General Electric, Maytag, Singer, Yamaha, and Whirlpool.

To go shopping on-line, you'll need a computer, a modem and communications software, a subscription to one of the networks, and for placing an order, a major credit card, or, in some cases, a checking account. Before you can order, however, you will need to register and receive an account number (for instance, by calling Comp-u-store directly, members can get a six-month subscription for only \$1).

Depending on the baud rate, charges for on-line shopping during non-prime time can range from \$.10/minute (\$6.00/hour) to \$.52/minute (\$31.20/hour). Prime-time rates run higher. First-time users should be aware that they can incur



pretty hefty on-line costs as they meander through the mall.

WHY BOTHER?

Who'd want the inconvenience of going on-line to shop for a described item when they could just get in their car and drive to the nearest mall to make a purchase? People like UCLA senior Tony McNamara, age 22, of Los Angeles, who are "anti-crowd" and "dislike malls intensely"; for them, it's like an answer to a prayer.

McNamara says he also prefers shopping on-line because "usually the prices are lower because the on-line retailers have less overhead." The connect-time charges don't seem to bother McNamara. He says

he "equates the charges to parking meter fees."

And for Lisa Stamp, 29, of Houston, who has a neuromuscular disease, shopping on-line is easy, practical, and even fun. "Ordering via CompuServe is a whole lot easier for me than going to a store to shop," Stamp says. When she first started shopping on-line about three years ago, she says, "Electronic window shopping was a lot of fun. It's what I did when I wanted to pretend about what I could afford." One of Stamp's earliest purchases was a Panasonic Easa-Phone speakerphone, which she says "was about \$80 or \$90 [10-20 percent off its regular price, including shipping] at the Electronic Mall." She received it in the mail a week after placing her order.

When 16-year-old Christopher Dixon, of Sewickley, Pennsylvania, went shopping on-line, he "was surprised by the variety of stores." He has since purchased numerous software packages—including *Stationfall* (Infocom), *The Homemaker* (Davidson & Associates), and *Ancient Art of War* (Broderbund)—at a discount of about 10 percent.

COMPARISON SHOPPING

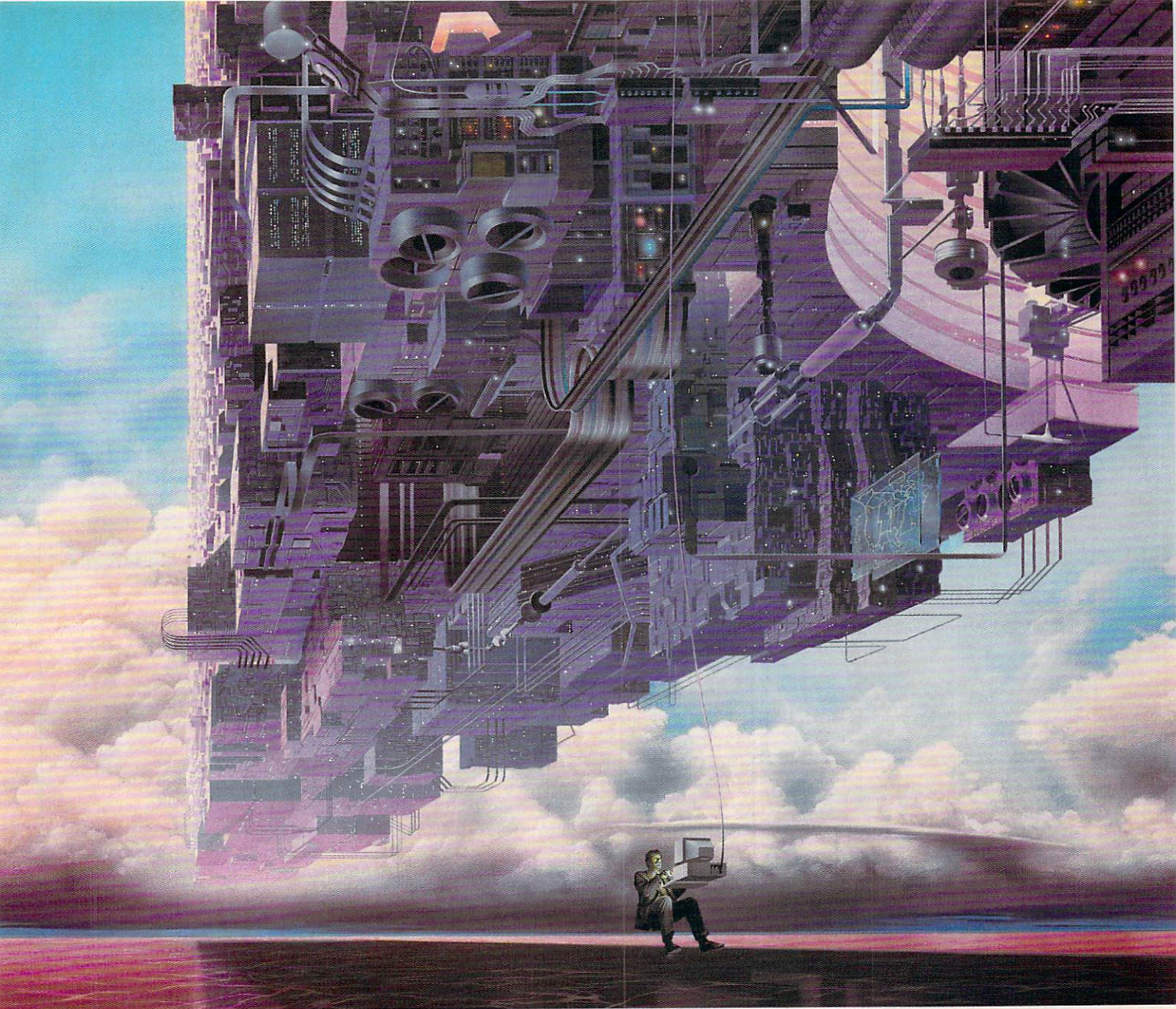
Some merchants at the on-line malls offer their wares at discounted prices because of contracts they've made with supporting net-

COSTS FOR ON-LINE SHOPPING

SHOPPING SERVICES	NETWORK	COSTS* NPT/PT	ITEMS AVAILABLE
Comp-u-store (800) 843-7777	CompuServe	\$.10/\$.10, \$.21/\$.21, \$.21/\$.21	appliances, stereo equipment,
	Dow Jones News/Retrieval	\$.20/\$.95, \$.44/\$2.09, \$.52/\$2.47	computers and accessories, sports equipment, home furnishings,
	Genie	\$.09/\$.58, \$.09/\$.58, \$.21/\$.71	silverware, china, luggage, watches
	The Source	\$.14/\$.36, \$.18/\$.43, \$.20/\$.46	
	Electronic Mall (800) 338-1831	(see above)	apparel, books, gourmet foods, flowers, computers and peripherals, beauty aids, office supplies, discounted travel packages

*Rates listed per minute for non-prime time (NPT) and prime time (PT) at 300-, 1200-, and 2400-baud, respectively.

STEPHANIE ESTERS is copy editor for FAMILY & HOME-OFFICE COMPUTING.



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TELECOMPUTING

works and because of the absence of the usual overhead costs such as employee salaries and electrical expenses for daily operation. The savings are passed on to the shopper; but be sure to inquire whether shipping costs are included in the quoted prices.

Purchasing an item you can't see or touch before you buy it requires a lot of courage. Many of the merchants offer catalogs that shoppers can order while on-line. Once shoppers have the catalogs in-hand, they can actually see the items offered on-line. Customers have the option, as McNamara did, of going back on-line to order or "calling the company up and ordering that way."

Aside from the discounted prices, shopping on-line can offer another advantage over straight catalog shopping: comparison shopping among a broad range of products from competing manufacturers. You could compare an item like Panasonic's KXT1427 voice-activated answering machine for \$103 (regularly \$140) with AT&T's 1310 answering machine for \$74, listed at \$110. If these don't suit your needs, you could look into other types of answering machines. A vendor's catalog may represent only one brand at a certain price level.

Some of the services also offer great bargain policies. Comp-u-store, for instance, has what it calls a "lowest-price guarantee." According to Robin Mulligan, marketing director for Comp-u-store, the policy states, "If within 30 days you can find the item you purchased through Comp-u-store elsewhere for a lower price, . . . we will refund the difference."

TIME IS MONEY

Connect-time charges for on-line shopping can be bothersome. It's easy for shoppers to be unaware of how much time they have actually spent on-line. Trying to escape from your present screen or searching for the main menu can take time. At prime-time rates of \$2.09/minute, for instance, it's a good idea to know where you want to go and head there quickly. An on-line cruise could easily surpass the \$1.19 you would spend per gallon of gas to drive to and from the mall plus the cost of the lunch you might have after a Saturday shopping spree.

In addition, shoppers often find their on-line shopping experiences

confusing and frustrating. Imagine being stuck in one section of the Electronic Mall when you'd really like to be about three screens back. So until you learn to maneuver your way around, you'll probably chew quite a few fingernails—and pay for them.

MANEUVERING AROUND THE MALL

"The menu that comes up when you first get on is a little confusing. I wasn't sure where to go from there," recalls Dixon of his first on-line shopping venture. He's not alone in criticizing the mall's menus. Dixon says he learned to maneuver through the system by "mainly trial and error." His suggestion for improvement: "An introductory screen telling people where to go."

Alexander Fiato, 37, of Fort Wayne, Indiana, recounts a similar experience. After a short stint almost three years ago with electronic shopping, he became disheartened by the absence of instructions or clear-cut directions for prompting users through the browsing and purchasing.

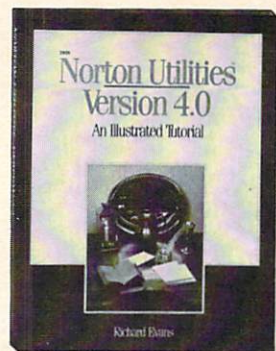
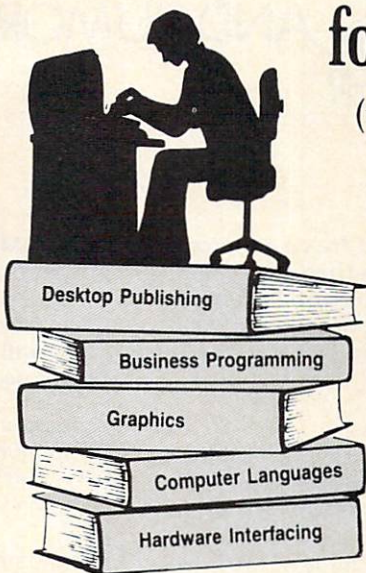
"I don't think I got a real good grasp of how to get information or how to use it," he explained. "It's the subtle things that discouraged me. I needed someone to walk me through the system . . . to show me that it isn't so mysterious." He does, however, encourage others to try electronic shopping.

THE WAVE OF THE NINETIES?

"On-line shopping accounts for a very small portion of on-line revenue," says Jim Ivers, senior analyst with LINK Resources Corp., a New York City-based market-research and consulting firm. And even though some teleshoppers feel that electronic shopping is the newest wave of the future, and new services like Trintex's Prodigy (see review in April *Telecomputing* department) are counting on its increasing popularity, Ivers says, "On-line shopping is not going to replace catalog shopping and is certainly not going to replace traditional shopping."

Maybe not, but electronic shopping is at least worth a try. You may find that the convenient comparison shopping and substantial discounts offered on-line make it a practical and enjoyable alternative to a trip to the mall. ■

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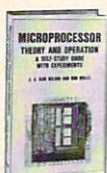
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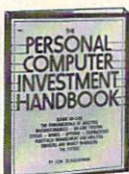
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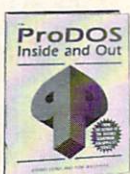
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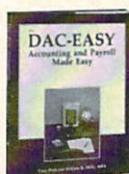
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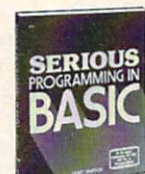
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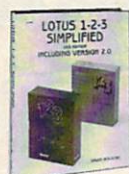
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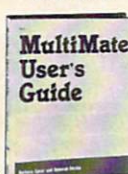
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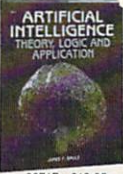
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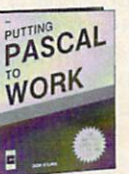
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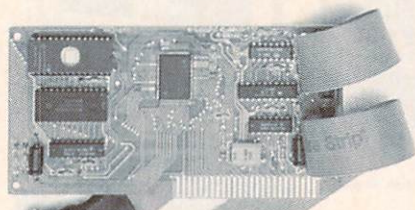
BY CHARLES H. GAJEWAY

APPLE II

One aspect of the Apple II that has always annoyed me is its small 143K floppy-disk capacity. It's annoying because you quickly amass a confusingly large inventory of disks and must constantly change disks as you work.

To date, the most cost-effective solution has been the Sider hard-disk drive (First Class Peripherals; \$595), which can be configured to work with the major Apple operating systems and offers 20MB of storage for about the same money as a pair of Apple's 800K Uni-Disk 3.5-inch floppy drives.

Use 400K Mac Drives! Now there are a couple of Apple II floppy-disk alternatives that seem very attractive. For those who want more storage at a minimum cost, there is the Universal Disk Controller (UDC) from Central Point Software. The UDC (\$90)



The Universal Disk Controller from Central Point Software offers added storage space for the IIc, IIgs, and Macintosh.

will accept any Apple-format drive equipped with the 19-pin plug used on the IIc, GS, and Macintosh! (Adapters are available to convert drives equipped with the older Disk II connector, but the Duo-Disk drive cannot be used.)

I tested the UDC with a Disk II, a non-Apple 5.25-inch drive, an 800K Disk 3.5, a Chinon 800K drive (Central Point Software; \$199), and both 800K and 400K Macintosh drives. All of the drives worked smoothly.

The 400K Mac drive is a particularly attractive alternative for the cost-conscious Apple II owner. Be-

cause 800K Mac drives are now available for less than \$200, and the 400K units are essentially obsolete, these drives are often available at bargain prices. In fact, I've got one I can't give away!

MACINTOSH

The latest generation of Macintosh software is making heavier demands on memory and disk storage. This was really driven home when I discovered that the 2MB of RAM and 20MB hard drive installed in my office Mac are barely adequate to run *Jazz* and *Fourth Dimension* under the long-awaited *MultiFinder*. Clearly, Mac users, particularly those with 512K and 128K machines, must seriously consider expanding their machines if they wish to keep abreast of software developments.

Expanding a 128K or 512K Mac. Unfortunately, adding memory to a 128K or 512K Mac is not a simple plug-in affair. Expanding the RAM of these older machines requires shipping your Mac to a firm specializing in such modifications and having them install up to 2MB on your old board.

If you think you may need to expand further, then you should consider Apple's Mac Plus system board upgrade (\$799), which will allow you to install up to 4MB. However, be aware that some owners of older Macs have had trouble with their system's power supply after adding these upgrade products.

Whether you choose a memory expansion or system board upgrade, you should definitely have your dealer install the Hierarchical File System (HFS) upgrade package (128K system ROM and 800K disk drive). More and more programs are being distributed only in the 800K format, and the current street price of about \$275 for the HFS upgrade is reasonable.

Expanding a Mac Plus. There are 2MB expansion modules available from MacMemory (Siclone Sales Engineering; \$399), SuperMac (\$399), and others. These modules generally use two single in-line memory mod-

ule (SIMM) sockets, allowing you to expand to 4MB in the future, when 1MB SIMM prices drop to a reasonable level. Unfortunately, these modules will not usually fit in a Mac equipped with an internal hard disk.

CHARLES H. GAJEWAY can be reached on CompuServe (ID: 73357.3577) or on GENie (ID: C GAJEWAY).

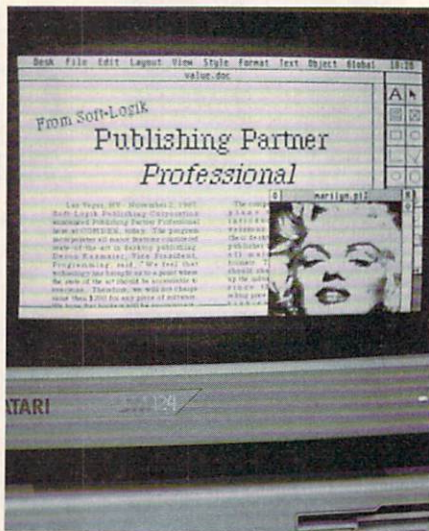
ATARI

BY MATTHEW STERN

Yankees versus Red Sox. Oklahoma versus Nebraska. Lakers versus Celtics. Atari versus Commodore! ST and Amiga owners will argue the virtues of their machines passionately, *ad infinitum*.

However, a growing number of hardware and software developers have looked beyond the rivals' passions and found profits in supporting both computers. Staunch Amiga developers have broadened their customer base by supporting the ST, and vice versa. As a result, both Amiga and ST users are benefiting from a wider selection of quality products.

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92	Elizabeth	8989 Elderberry St.	\$238,000
93	James	9090 Blackberry St.	\$240,000
94	Christine	9191 Boysenberry St.	\$242,000
95	Michael	9292 Mulberry St.	\$245,000
96	Shirley	9393 Elderberry St.	\$248,000
97	Donald	9494 Blackberry St.	\$250,000
98	Donna	9595 Boysenberry St.	\$252,000
99	Edward	9696 Mulberry St.	\$255,000
100	Carolyn	9797 Elderberry St.	\$258,000
101	Robert	9898 Blackberry St.	\$260,000
102	Barbara	9999 Boysenberry St.	\$262,000
103	Richard	10000 Mulberry St.	\$265,000
104	Patricia	10101 Elderberry St.	\$268,000
105	Christopher	10202 Blackberry St.	\$270,000
106	Michelle	10303 Boysenberry St.	\$272,000
107	Gregory	10404 Mulberry St.	\$275,000
108	Deborah	10505 Elderberry St.	\$278,000
109	Anthony	10606 Blackberry St.	\$280,000
110	Elizabeth	10707 Boysenberry St.	\$282,000
111	James	10808 Mulberry St.	\$285,000
112	Christine	10909 Elderberry St.	\$288,000
113	Michael	11010 Blackberry St.	\$290,000
114	Shirley	11111 Boysenberry St.	\$292,000
115	Donald	11212 Mulberry St.	\$295,000
116	Donna	11313 Elderberry St.	\$298,000
117	Edward	11414 Blackberry St.	\$300,000
118	Carolyn	11515 Boysenberry St.	\$302,000
119	Robert	11616 Mulberry St.	\$305,000
120	Barbara	11717 Elderberry St.	\$308,000
121	Richard	11818 Blackberry St.	\$310,000
122	Patricia	11919 Boysenberry St.	\$312,000
123	Christopher	12020 Mulberry St.	\$315,000
124	Michelle	12121 Elderberry St.	\$318,000
125	Gregory	12222 Blackberry St.	\$320,000
126	Deborah	12323 Boysenberry St.	\$322,000
127	Anthony	12424 Mulberry St.	\$325,000
128	Elizabeth	12525 Elderberry St.	\$328,000
129	James	12626 Blackberry St.	\$330,000
130	Christine	12727 Boysenberry St.	\$332,000
131	Michael	12828 Mulberry St.	\$335,000
132	Shirley	12929 Elderberry St.	\$338,000
133	Donald	13030 Blackberry St.	\$340,000
134	Donna	13131 Boysenberry St.	\$342,000
135	Edward	13232 Mulberry St.	\$345,000
136	Carolyn	13333 Elderberry St.	\$348,000
137	Robert	13434 Blackberry St.	\$350,000
138	Barbara	13535 Boysenberry St.	\$352,000
139	Richard	13636 Mulberry St.	\$355,000
140	Patricia	13737 Elderberry St.	\$358,000
141	Christopher	13838 Blackberry St.	\$360,000
142	Michelle	13939 Boysenberry St.	\$362,000
143	Gregory	14040 Mulberry St.	\$365,000
144	Deborah	14141 Elderberry St.	\$368,000
145	Anthony	14242 Blackberry St.	\$370,000
146	Elizabeth	14343 Boysenberry St.	\$372,000
147	James	14444 Mulberry St.	\$375,000
148	Christine	14545 Elderberry St.	\$378,000
149	Michael	14646 Blackberry St.	\$380,000
150	Shirley	14747 Boysenberry St.	\$382,000
151	Donald	14848 Mulberry St.	\$385,000
152	Donna	14949 Elderberry St.	\$388,000
153	Edward	15050 Blackberry St.	\$390,000
154	Carolyn	15151 Boysenberry St.	\$392,000
155	Robert	15252 Mulberry St.	\$395,000
156	Barbara	15353 Elderberry St.	\$398,000
157	Richard	15454 Blackberry St.	\$400,000
158	Patricia	15555 Boysenberry St.	\$402,000
159	Christopher	15656 Mulberry St.	\$405,000
160	Michelle	15757 Elderberry St.	\$408,000
161	Gregory	15858 Blackberry St.	\$410,000
162	Deborah	15959 Boysenberry St.	\$412,000
163	Anthony	16060 Mulberry St.	\$415,000
164	Elizabeth	16161 Elderberry St.	\$418,000
165	James	16262 Blackberry St.	\$420,000
166	Christine	16363 Boysenberry St.	\$422,000
167	Michael	16464 Mulberry St.	\$425,000
168	Shirley	16565 Elderberry St.	\$428,000
169	Donald	16666 Blackberry St.	\$430,000
170	Donna	16767 Boysenberry St.	\$432,000
171	Edward	16868 Mulberry St.	\$435,000
172	Carolyn	16969 Elderberry St.	\$438,000
173	Robert	17070 Blackberry St.	\$440,000
174	Barbara	17171 Boysenberry St.	\$442,000
175	Richard	17272 Mulberry St.	\$445,000
176	Patricia	17373 Elderberry St.	\$448,000
177	Christopher	17474 Blackberry St.	\$450,000
178	Michelle	17575 Boysenberry St.	\$452,000
179	Gregory	17676 Mulberry St.	\$455,000
180	Deborah	17777 Elderberry St.	\$458,000
181	Anthony	17878 Blackberry St.	\$460,000
182	Elizabeth	17979 Boysenberry St.	\$462,000
183	James	18080 Mulberry St.	\$465,000
184	Christine	18181 Elderberry St.	\$468,000
185	Michael	18282 Blackberry St.	\$470,000
186	Shirley	18383 Boysenberry St.	\$472,000
187	Donald	18484 Mulberry St.	\$475,000
188	Donna	18585 Elderberry St.	\$478,000
189	Edward	18686 Blackberry St.	\$480,000
190	Carolyn	18787 Boysenberry St.	\$482,000
191	Robert	18888 Mulberry St.	\$485,000
192	Barbara	18989 Elderberry St.	\$488,000
193	Richard	19090 Blackberry St.	\$490,000
194	Patricia	19191 Boysenberry St.	\$492,000
195	Christopher	19292 Mulberry St.	\$495,000
196	Michelle	19393 Elderberry St.	\$498,000
197	Gregory	19494 Blackberry St.	\$500,000
198	Deborah	19595 Boysenberry St.	\$502,000
199	Anthony	19696 Mulberry St.	\$505,000
200	Elizabeth	19797 Elderberry St.	\$508,000
201	James	19898 Blackberry St.	\$510,000
202	Christine	19999 Boysenberry St.	\$512,000
203	Michael	20000 Mulberry St.	\$515,000
204	Shirley	20101 Elderberry St.	\$518,000
205	Donald	20202 Blackberry St.	\$520,000
206	Donna	20303 Boysenberry St.	\$522,000
207	Edward	20404 Mulberry St.	\$525,000
208	Carolyn	20505 Elderberry St.	\$528,000
209	Robert	20606 Blackberry St.	\$530,000
210	Barbara	20707 Boysenberry St.	\$532,000
211	Richard	20808 Mulberry St.	\$535,000
212	Patricia	20909 Elderberry St.	\$538,000
213	Christopher	21010 Blackberry St.	\$540,000
214	Michelle	21111 Boysenberry St.	\$542,000
215	Gregory	21212 Mulberry St.	\$545,000
216	Deborah	21313 Elderberry St.	\$548,000
217	Anthony	21414 Blackberry St.	\$550,000
218	Elizabeth	21515 Boysenberry St.	\$552,000
219	James	21616 Mulberry St.	\$555,000
220	Christine	21717 Elderberry St.	\$558,000
221	Michael	21818 Blackberry St.	\$560,000
222	Shirley	21919 Boysenberry St.	\$562,000
223	Donald	22020 Mulberry St.	\$565,000
224	Donna	22121 Elderberry St.	\$568,000
225	Edward	22222 Blackberry St.	\$570,000
226	Carolyn	22323 Boysenberry St.	\$572,000
227	Robert	22424 Mulberry St.	\$575,000
228	Barbara	22525 Elderberry St.	\$578,000
229	Richard	22626 Blackberry St.	\$580,000
230	Patricia	22727 Boysenberry St.	\$582,000
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232	Michelle	22929 Elderberry St.	\$588,000
233	Gregory	23030 Blackberry St.	\$590,000
234	Deborah	23131 Boysenberry St.	\$592,000
235	Anthony	23232 Mulberry St.	\$595,000
236	Elizabeth	23333 Elderberry St.	\$598,000
237	James	23434 Blackberry St.	\$600,000
238	Christine	23535 Boysenberry St.	\$602,000
239	Michael	23636 Mulberry St.	\$605,000
240	Shirley	23737 Elderberry St.	\$608,000
241	Donald	23838 Blackberry St.	\$610,000
242	Donna	23939 Boysenberry St.	\$612,000
243	Edward	24040 Mulberry St.	\$615,000
244	Carolyn	24141 Elderberry St.	\$618,000
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246	Barbara	24343 Boysenberry St.	\$622,000
247	Richard	24444 Mulberry St.	\$625,000
248	Patricia	24545 Elderberry St.	\$628,000
249	Christopher	24646 Blackberry St.	\$630,000
250	Michelle	24747 Boysenberry St.	\$632,000
251	Gregory	24848 Mulberry St.	\$635,000
252	Deborah	24949 Elderberry St.	\$638,000
253	Anthony	25050 Blackberry St.	\$640,000
254	Elizabeth	25151 Boysenberry St.	\$642,000
255	James	25252 Mulberry St.	\$645,000
256	Christine	25353 Elderberry St.	\$648,000
257	Michael	25454 Blackberry St.	\$650,000
258	Shirley	25555 Boysenberry St.	\$652,000
259	Donald	25656 Mulberry St.	\$655,000
260	Donna	25757 Elderberry St.	\$658,000
261	Edward	25858 Blackberry St.	\$660,000
262	Carolyn	25959 Boysenberry St.	\$662,000
263	Robert	26060 Mulberry St.	\$665,000
264	Barbara	26161 Elderberry St.	\$668,000
265	Richard	26262 Blackberry St.	\$670,000
266	Patricia	26363 Boysenberry St.	\$672,000
267	Christopher	26464 Mulberry St.	\$675,000
268	Michelle	26565 Elderberry St.	\$678,000
269	Gregory	26666 Blackberry St.	\$680,000
270	Deborah	26767 Boysenberry St.	\$682,000
271	Anthony	26868 Mulberry St.	\$685,000
272	Elizabeth	26969 Elderberry St.	\$688,000
273	James	27070 Blackberry St.	\$690,000
274	Christine	27171 Boysenberry St.	\$692,000
275	Michael	27272 Mulberry St.	\$695,000
276	Shirley	27373 Elderberry St.	\$698,000
277	Donald	27474 Blackberry St.	\$700,000
278	Donna	27575 Boysenberry St.	\$702,000
279	Edward	27676 Mulberry St.	\$705,000
280	Carolyn	27777 Elderberry St.	\$708,000
281	Robert	27878 Blackberry St.	\$710,000
282	Barbara	27979 Boysenberry St.	\$712,000
283	Richard	28080 Mulberry St.	\$715,000
284	Patricia	28181 Elderberry St.	\$718,000
285	Christopher	28282 Blackberry St.	\$720,000
286	Michelle	28383 Boysenberry St.	\$722,000

MACHINE SPECIFICS

maier, vice president of research and development at Soft-Logik, maker of the popular *Publishing Partner* desktop-publishing program for the ST, said in a CompuServe conference last year, "Hi-res on the Amiga monitor is unusable. Imagine doing *Publishing Partner* in color for professional jobs. . . . I think the 'GDOS' print drivers for the Amiga leave a lot to be desired."

Apparently, Kazmaier and Soft-Logik had a change of heart. The company has introduced an enhanced version of its product, called *Publishing Partner Professional* (\$200), for both the ST and Amiga. (The price is \$55 if you turn in an old version of *Publishing Partner* for the ST or *PageSetter* for the Amiga.)

Both versions contain all the popular features of the original ST version, such as on-screen text editing, macros, and laser-printer support. Enhancements include stylesheet tags for saving your frequently used formats and improved print drivers for 9-pin and 24-pin dot-matrix printers.

Publishing Partner Professional will read documents from most popular word processors and retain their original styles.

Soft-Logik says that Atari and Amiga *Partner* documents will be compatible with each other. Your friend can paste in *DeluxePaint* pictures with the Amiga version, and you can finish the layout on your Atari.

SupraModem 2400. Supra Corporation's SupraModem 2400 (\$180) supports the Hayes "AT" command set and operates at 300, 1200, and 2400 baud. The front panel sports a complete set of status lights and a handy ON-OFF button. The ST version includes a cable and a telecommunications program.

MATTHEW STERN can be reached on CompuServe (ID: 73547, 2420).

COMMODORE

BY SHAY ADDAMS

Commodore hasn't been touting this new product, so I didn't discover the release of its 3.5-inch drive for the 64 and 128 until a recent trip to the mall. The 1581 drive (\$249), whose disks store 800K, is a practical item,

especially for business users. Besides its extra storage capability, the drive can load and save information up to 30 percent faster than can a 1541 drive (on a 64) or a 1571 drive (on a 128).

Dual Commodore serial ports enable you to daisy-chain it to several other drives, and you don't have to attack the drive's innards with a machete to change the device number. (That's the "8" when you type "Load *8.1." To access a different drive, you'd substitute a "9" for the "8.")

The new drive also supports sub-directories, so you group your files into the equivalent of file drawers, somewhat like a hard disk. No software is yet available on the 800K disks, but the drive comes with utilities that let you copy files between the 1571 or 1541's 5.25-inch and 3.5-inch formats.

If you're considering the 1581, make sure your protected software will run on it. Commodore says the following programs work without a hitch: *SuperScript*, *EasyScript*, *PaperClip*, *Pocket Writer*, *Fleet System 2*, and *VizaWrite*. For others, check with the program's manufacturer if in doubt. Unprotected software can be copied to the 800K disks, really reducing access time.

A 1571 Trick. Incidentally, if you're running a 1571 with the 64 there is a way to write to (and read from) both sides of the disk. When you power up, the drive goes into 1541 mode because it's attached to a 64. But the BASIC statement OPEN 15,8,15,"UO:M1":CLOSE15 will return you to 1571 mode. That gives you access to a whopping 1,328 blocks until you shut down. If for some reason

you want to revert to 1541 mode, type OPEN15,8,15,"UO:M0":CLOSE15.

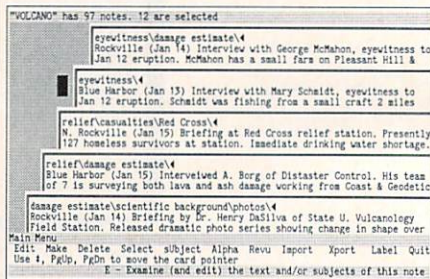
SHAY ADDAMS, editor and publisher of *Questbusters*, an adventure-game newsletter, can be reached on CompuServe (ID: 72267.601) or on QuantumLink (ID: JBCALMER).

IBM

BY HENRY BEECHHOLD

Even though the new IBM PS/2 line is supposed to put a dent in the "clone" market, IBM-compatible computers are still selling like hotcakes. New versions of 286 and 386 machines (see "Solving the IBM-Compatibles Puzzle" in the March issue) are irresistible from a cost-benefit point of view. A loaded AT clone can be purchased for about \$2,500. This cutthroat competition is forcing IBM dealers to discount the entire PS/2 line by more than 30 percent. Look for a deal.

Squarenote. If you've used actual card-filing systems of any sort, you already know how to use *Squarenote*, *The Idea Librarian* (Union-Squareware; \$99). You can create an



Quickly scroll through notes with the on-screen browsing feature of *Squarenote* from Union-Squareware.

unlimited number of files and up to 100 subjects per note; each card can contain up to 10 single-spaced pages of free-form information (no field definitions required). The program will stack and restack the cards according to any search criteria you choose, and you can import and export ASCII text files. Editing is done with the built-in word processor. This is a first-rate program for anyone who keeps a diversity of card-sized records; it's especially valuable for researchers.

HENRY BEECHHOLD is author of *The Brady Guide to Microcomputer Troubleshooting & Maintenance* (Brady Books, Prentice Hall Press, New York).

PHONE NUMBERS

Apple Computer, Inc. (408) 996-1010
Atari Computer, Inc. (408) 745-2000
Central Point Software (503) 244-5782
Commodore (215) 431-9100
First Class Peripherals (702) 883-4000
IBM (800) 447-4700
Paul Mace Software (503) 488-0224
Personal Computer Support Group (214) 351-0564
S/D Enterprises (503) 663-2865
Siclone Sales Engineering (408) 748-0511
Soft-Logik (314) 894-8608
SuperMac Technologies, Inc. (415) 964-8884
Supra Corporation (503) 967-9075
Union-Squareware (617) 623-3023
Tandy/Radio Shack Computer (817) 390-3011

MS-DOS

BY STEVE MORGENSTERN

I have worked extensively with two disk-caching programs—*Lightning* (Personal Computer Support Group; \$90) and the cache program included with *Mace Utilities* (Paul Mace Software; \$99). Both work well and can really speed up disk-intensive programs. Here's how they work.

An area of RAM is set aside for disk caching; how much depends on the memory available in your computer. Each time you access a program or large file in your disk drive, a small segment of data is retained in the disk-cache memory. Then, the next time you need to perform that same program function or access that part of the file, the computer doesn't have to access the disk drive because the data is already in memory.

Of course, the more memory you can afford to devote to the disk cache, the more efficient the technique. *Lightning* starts with a 60K buffer, but you can expand it considerably. By adding a megabyte of memory to my system and devoting it to a disk cache, I cut my disk access by 90 percent when using *Ventura Publisher*.

Dropping Modem Prices. With modem prices dropping through the floor (you can buy a respectable 1200-baud modem today for a little more than \$100), many of you are probably taking your first steps into the world of telecommunications. Let me take a few seconds to review some mistakes and confusion I experienced soon after attaching a modem to a PC compatible.

Settings Made Easy. Most telecommunications software packages give you a bewildering choice of settings and standards that have to match the computer you're calling. Relax. If you're planning to call the major commercial on-line services or private bulletin boards, forget about fancy terminal emulation settings such as VT100 and IBM 3101: you only want "TTY" or "None." For the rest, just set the modem to 8 data bits, no parity, 1 stop bit, and full duplex. If that doesn't work, try 7 data bits, even parity, and 1 stop bit.

If Auto-Redial Doesn't Work. Many telecommunications packages profess to disconnect the call if you re-

ceive a busy signal. Others go even farther: they'll continue to redial the number until you get through (useful if you're calling a busy bulletin board). I couldn't get either feature to work. Finally, I learned that some modems recognize a busy signal and report it back to the computer, others don't. Mine (a Leading Edge Model L) doesn't.

Telecommunications programs are designed to service many different modem capabilities, so it's important to read the modem documentation along with the software documentation.

STEVE MORGENSTERN can be reached on CompuServe (ID: 72545.606).

TANDY

BY STEPHEN MILLER

Since computers are such an integral part of my life, it's difficult to go anywhere without one. But sometimes traveling with a computer can present unexpected problems. I left the country a few months ago on a magazine assignment and took along my Tandy 1400LT Portable so that I could write while traveling. I thought I might try sending copy via modem if the need arose.

One complaint I have about the 1400LT (see a more complete review in February's *Product Reviews*) is that you can't switch it to different power supplies. In the United States, we operate on 110–120 volts, but much of the rest of the world operates on 220–240 volts. Switching directly to a different power supply can damage electronic equipment.

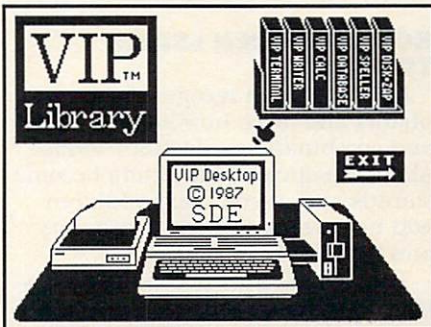
To compensate for the differences, some portable computers have a switch that allows an instant change to another system. I could have taken extra rechargeable batteries, but at the time, spare batteries were as hard to come by as the 1400's padded carrying case. There was also the problem of the length of my trip. I was gone for eight days and even with only a couple of hours use a day, I would have needed four batteries per day to make the trip. The batteries last only four hours per charge.

But the solution was simple. In

this case it was buying a \$15 transformer from—where else?—Radio Shack. I checked with the engineers at Tandy before embarking on this trip because I was worried about damaging the computer. It was a new problem for them also, but they gave me some good advice that allowed me to make the trip a huge computing success.

If you're planning a trip out of the country, make sure that the transformer you buy is rated for at least 1,000 watts. *Under no circumstances* should you try to run the computer from the 220-volt power supply. The transformer connected to the 220-volt supply is just a technique for recharging the battery. An overnight charge should be sufficient.

VIP for the CoCo 3. *VIP Writer* (\$70), *VIP Speller* (\$35), *VIP Calc* (\$60), *VIP Database* (\$50), and *VIP Terminal* (\$40) have all been upgraded to run on the CoCo 3, as well as earlier CoCo models. If you own the original version of any of these programs, you can get an upgrade by sending in the original disk and \$30 (plus \$3 shipping) to S/D Enterprises, P.O. Box 1233, Gresham, OR 97030.



The VIP Integrated Library combines all six VIP applications programs onto one disk.

If you send in any one disk and \$100, you can get the entire *VIP Library* (all the programs run as an integrated package under a menu program called *Desktop*). Buying the VIP programs individually would cost you more than \$279.

In addition, *VIP Writer III* (\$80) has been introduced. The program runs on CoCo 3 only. Owners of previous *VIP Writer* versions can upgrade to the new *III* product for \$50, plus \$3 shipping.

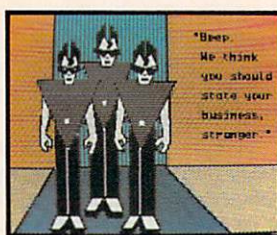
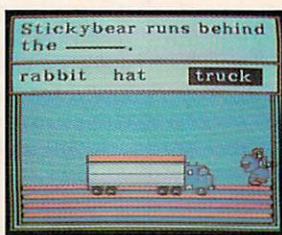
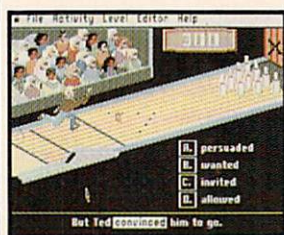
Complicated, I know, but this is what it takes to stay *au courant*.

STEPHEN MILLER is a computer consultant and journalist.

EDUCATION

READING, THE KEY TO LIFELONG LEARNING

A Look at Reading Skills Programs **BY GWEN SOLOMON**



From left to right: Play the Vocabulary Building Bowling Game in *Read 'N Roll*; build a sentence and watch it come to life in *Stickybear Reading*; Barnacans may confront you as you choose your path in "Brain Drain," a *Microzine Twistaplot*.

We built with wooden alphabet blocks, looked at picture books, and read *Dick and Jane*. Then we read comic books at night under the covers with a flashlight, exchanged *Nancy Drew* and *Hardy Boys* mysteries, and cried over *Charlotte's Web*. Those first reading memories sure are sweet.

Reading is a basic skill, and more important, it is the key to learning. From preschool days until adulthood, children read and assimilate information through books and other written media. Children who start out as good readers early in life usually become adults who enjoy reading for fun and for education.

HOW CHILDREN LEARN TO READ

First, children recognize the alphabet and learn how single letters and combinations of letters sound. Almost magically, the letters become sounds and words. Next, children add new words to their vocabulary and begin to read passages.

Then their skills become more sophisticated. For example, children learn to detect the main idea of a story and determine which details are stated and which are implied. They also learn to use surrounding words to decipher new vocabulary, draw conclusions, find facts, understand cause and effect, and follow the order of events.

Perhaps the most important element in children's motivation to read is their parents' attitudes. Most parents read to their children, share their love for the written word, and encourage them to read. Soon children begin to see that reading is a doorway to the adult world and

want to learn to read.

Today with computers and good reading software, children can be introduced to letters and words on-screen. Six-year-old Jessica Butler, of Rye, New York, for instance, boots up *Reader Rabbit* for fun and, simultaneously, practices reading skills. The computer games reinforce what she learns from the books, games, television, and other educational aids provided by her parents.

In this article, we'll look at some of the outstanding software packages like the one Jessica uses.

EARLY READING PROGRAMS

Most beginning reading programs teach children how letter and letter combinations sound. In *Reading I* (Spinnaker Software; ages 3-6), based on Beatrice Potter's *Peter Rabbit*, children sound out combinations of letters and whole words, match letters, relate sounds to symbols, and use vowels and consonants to get Peter Rabbit home to Mrs. Rabbit.

Programmer Frank Holmes developed *Fun with Letters and Words* (Wescott Software; for ages 2-6) to help his daughter learn initial sounds. Children strike a letter on the keyboard, and a word that begins with that letter appears on the screen. The package uses animation and music, and parents can customize the word list to include names and birthdays.

Reader Rabbit (The Learning Company; ages 4-7), Jessica's favorite, helps children match and unscramble letters and words in the Fabulous Word Factory. They can store words on shelves or drop them into the trash can, load words onto a train, label cartons for shipping, and play a matching game. These activities help reinforce word and letter patterns, strengthen concen-

tration and memory skills, and increase vocabulary.

PROGRAMS FOR COMPREHENSION

Reading II (Spinnaker Software; ages 6-9), based on Rudyard Kipling's *Jungle Book* stories, improves comprehension skills. Children must help Mowgli, the jungle boy, find Bagheera, the leopard who is trapped in a cave. When wild animals block Mowgli's path, reading passages appear, and children read and answer questions about the sequence of events, main ideas, facts, outcomes, and characters' actions.

Stickybear Reading Comprehension (Weekly Reader Software/Optimum Resource; ages 7-9), presents more than 30 stories with multiple-choice questions. There's no time limit on answering the questions, so children can read and reread passages at their own pace. This program also lets parents decide how to present information: they set the starting level and the number of opportunities the child gets. There is an option to customize the program with personal stories or make a printout for further reference. For more advanced readers, Weekly Reader offers *Reading Comprehension* (ages 9 and above).

Davidson's new program, *Read 'N Roll* (ages 8-12), offers directed reading activities. Children select the type of skill they want to practice: recognizing the main idea, recalling facts, identifying the sequence of events, drawing inferences, or building vocabulary. They read passages and answer questions that focus on the selected skill.

PROGRAMS THAT BUILD UPON THE BASICS

Once children master the basic reading skills, they advance to higher levels of sophistication, both in

GWEN SOLOMON is computer coordinator at Adlai E. Stevenson High School in Bronx, New York. She reviews software for FAMILY & HOME-OFFICE COMPUTING.

CARMEN STRIKES AGAIN!



WHERE IN EUROPE IS CARMEN SANDIEGO? SWEEPSTAKES

WIN A TRIP TO EUROPE FOR TWO; 4 days in London, 4 days in Paris; sightseeing tours, theater, 1st class accommodations, airfare and more! Sweepstakes starts March 15, 1988. Entries must be received by June 15, 1988.

SEE YOUR FAVORITE BRODERBUND RETAILER FOR COMPLETE ENTRY DETAILS. NO PURCHASE NECESSARY.

The thick night fog is torn by the shriek of a whistle as the Orient Express hurtles through the sleeping countryside. In one of the sleek train's compartments, a dim light illuminates the face of a striking woman. A slight smile plays over her lips: If all goes according to plan, when the citizens of Venice awake, they will find every last one of their precious gondolas missing. . .

Carmen's back! And you're going to have more thrills than ever as you chase her and her new gang. This time, they're out to steal the priceless treasures of Europe. They *must* be stopped!

Start out at the scene of the crime. Question witnesses, search for



ON-SCREEN MAP of Europe

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Before you're done, you'll know Europe inside out. But best of all, you'll have so much fun, they'll have to drag you away from the computer.

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54FCM

EDUCATION

reading materials and in comprehension abilities. A vocabulary development exercise now popular in schools is *cloze reading*, in which words are left out of passages and children infer the missing words from context clues. Two programs, for instance, that present cloze reading passages are Scholastic's *Success With Reading* (ages 8-13) and Sunburst's *M-ss-ng L-nks: Young People's Literature* (ages 8-adult).

This program displays passages from 9 children's classics, including C.S. Lewis's *The Lion, the Witch, & the Wardrobe*, Kenneth Grahame's *The Wind in the Willows*, and Laura Ingalls Wilder's *Little House in the Big Woods*. *M-ss-ng L-nks* omits letters, words, or whole sentences; the parent or youngster decides what to delete. For example, you can display a passage and omit every fifth word or choose to show the first and last letter of each word. Children fill in the blanks by making inferences

from context clues. You can also make a printout to reinforce the activity.

Another source of reading activities for children ages 9-14 is Scholastic's *Microzine*. Available by subscription (5 issues per year), this magazine-on-disk includes different types of programs. *Twistaplot*, one of the *Microzine* programs, is an interactive adventure that lets children read the story, decide what actions characters should take, and try different solutions. The plot branches in different directions each time. In "Brain Drain," one of the *Twistaplot* scenarios, children travel through space, explore strange planets, and outwit a villain as they try to locate a missing geologist.

READING IN THE FAST LANE

Once they get to high school and college, students face long reading lists, and speed becomes more important. Davidson's *Speed Reader II*

(ages 14 and above) can help high school and college students become faster and more efficient readers, enjoy reading more, and understand and retain what they read. The program uses a series of warm-up exercises and lessons that improve eye movement, includes exercises for scanning passages and columns, and presents timed readings. You sharpen perception, increase eye span, and improve eye movements by reading flashing words and quickly disappearing passages. Since you must remember these words and passages later, you reinforce comprehension skills as well.

Magnum Software's *Super Speed Reading* (ages 13 and above) equates speed with understanding. "When you read fast," claims the documentation, "you turn off all outside interference, and you become completely absorbed." This program is designed to increase reading speed from twice to ten times the current speed. It teaches scanning and skimming techniques, and to help pace yourself, it incorporates a computer metronome, which makes a steady, ticking noise, and a computer "pacer," which gives line-by-line display at a timed pace.

MEMORIES SURE ARE SWEET

Tobi Butler, Jessica's mother, is an educator who uses computers with her students and her own children as well. "My daughters are motivated to practice reading skills because of the computer. Programs such as *Reader Rabbit* offer enjoyable activities paired with positive reinforcement and stimulating graphics," she says.

Educators and parents agree that the most valuable reading programs let you add your own passages or words. You can extend the life of a program by including new, more difficult, or personalized words and passages. Children will eagerly help choose the words and create the story.

Reading software, just like word games and books, reinforces what children learn, strengthens new skills, and provides motivation. Children who start reading early usually develop a love of reading that will continue throughout their adult years. Someday they'll reminisce, "Sure, I remember tiptoeing to the computer and turning it on after Mom and Dad were asleep" ■

SOME OUTSTANDING READING SKILLS PROGRAMS

Fun with Letters and Words

Wescott Software
2316 Park Place
Evanston, IL 60201
(312) 328-1367
256K IBM PC (\$20)

Microzine

Scholastic Software
Scholastic, Inc.
730 Broadway
New York, NY 10003
(212) 505-3000
64K Apple (\$169 for five issues per year, \$40 for individual issues)

M-ss-ng L-nks: Young People's Literature

Sunburst Communications
39 Washington Ave.
Pleasantville, NY 10570
(800) 431-1934; (800) 247-6756 in Canada
48K Apple (\$65), C 64/128 (\$65), 128K IBM PC (\$65)

Read 'N Roll

Davidson & Associates, Inc.
3135 Kashiwa St.
Torrance, CA 90505
(213) 534-4070
128K Apple (\$50), 256K IBM PC (\$50)

Reader Rabbit

The Learning Company
6493 Kaiser Dr.
Fremont, CA 94555
(415) 792-2101
64K Apple (\$40), 256K IBM PC (\$40)

Reading Comprehension

Weekly Reader Software/Optimum Resource, Inc.

10 Station Place
Norfolk, CT 06058
(203) 542-5553
48K Apple (\$40), 128K IBM PC (\$40)

Reading I

Spinnaker Software Corp.
One Kendall Square
Cambridge, MA 02139
(617) 494-1200
64K Apple (\$40), C 64/128 (\$25)

Reading II

Spinnaker Software Corp.
(see above for address and phone)
64K Apple (\$40), C 64/128 (\$25)

Speed Reader II

Davidson & Associates, Inc.
(see left for address and phone)
48K Apple (\$70), C 64/128 (\$50), 128K IBM PC (\$70)

Stickybear Reading Comprehension

Weekly Reader Software/Optimum Resource, Inc.
(see above for address and phone)
48K Apple (\$40), C 64/128 (\$30), 128K IBM PC (\$40)

Success With Reading

Scholastic Software
(see left for address and phone)
48K Apple (\$100), C 64/128 (\$100)

Super Speed Reading

Magnum Software
21115 Devonshire St., Suite 337
Chatsworth, CA 91311
(818) 700-0510
48K Apple (\$60)

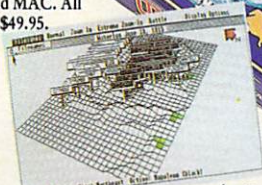
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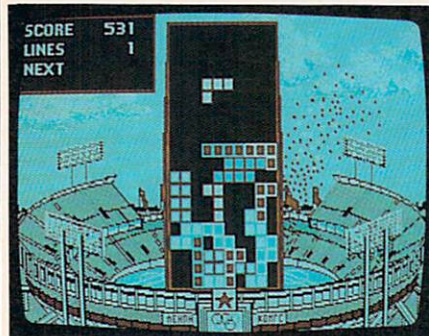
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ENTERTAINMENT

HINTS, NEWS, AND NEW GAME FORMATS

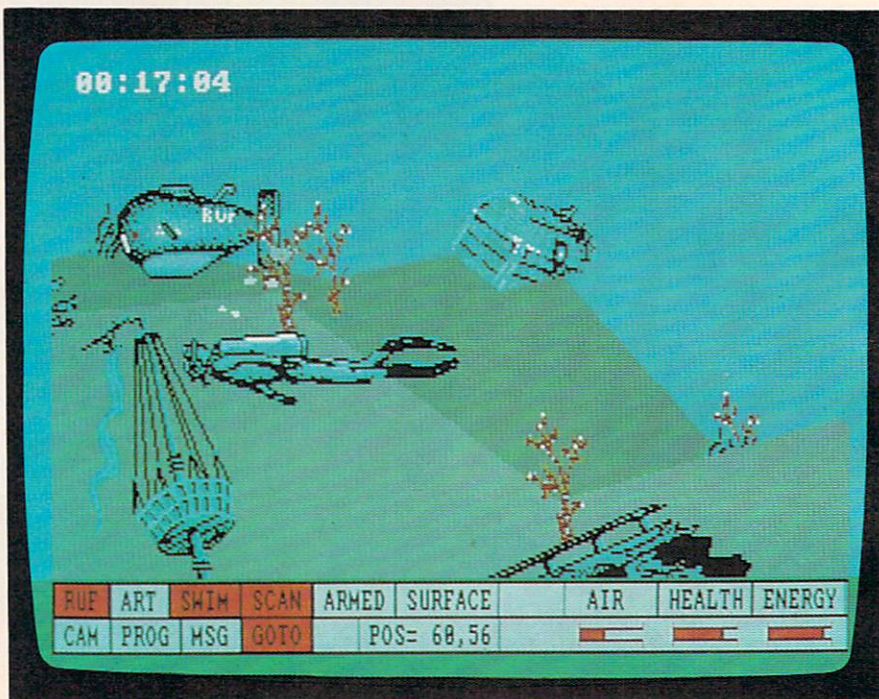
NEWS AND RUMORS

★ **Spectrum HoloByte's (SH)** new **International Series** is bringing entertainment from around the world into American homes. *Tetris*, SH's much-publicized Russian computer game, is now on store shelves throughout the country. The brainchild of two Soviet programmers, a university student and a researcher at the Academy of Scientists, *Tetris* (\$35, **512K Amiga**, **512K Atari ST**, **128K IBM PC**; \$25, **C 64/128**) is the first Russian computer game to make it to the West (via a programming company in Budapest). Rotate and flip falling objects, drop them into place, and score points. It's an addictive arcade-style game of skill and strategy that's easy to play but difficult to master. . . . From the United Kingdom, SH has brought us *Zig-Zag* (\$25, **C 128**), another arcade-style game. In your starfighter, you'll skim along at hyperspeed, zig-zagging down the passageways of the Matrix of Zog in the 12th dimension. . . . SH traveled to the Far East to bring back *Soko-Ban* (\$25, **C 64/128**; \$30 **256K IBM PC**), which plants you in the middle of a mazelike warehouse. Patience, timing, and strategy figure greatly in this game as you move the boxes to make your way through 99 floors. . . . Finally, from the good old U.S. of A., *In-*



Scenes of Russia are the backdrop for *Tetris*, a game of skill and strategy.

trigue! (\$30, **48K Apple**; \$25, **C 64/128**) takes you on a mission to deactivate a dangerous virus that may be unleashed on the nation's capital. Your trek takes you through the streets of D.C., where you'll scout for clues at the U.S. Embassy, the F.B.I. building, and other sites. Designed



Explore sunken ships and lost treasure in *Return to Atlantis*.

in black and white, the game has the look of such 1940's detective films as *The Maltese Falcon*. So grab your trench coat and felt hat.

★ Here's the scoop on five new games from **Electronic Arts (EA)**. Software designer **Brian Fargo** has completed *The Bard's Tale III: Thief of Fate* (\$50, **64K Apple**), which sends players back to Skara Brae, the setting of the original *Bard's Tale*. Two installments later, you find the city in ruins—you also find new spells, more dungeons and monsters, and an automatic mapping system. No more graph paper! . . . And the long-awaited *Return to Atlantis* is finally ready. We've been waiting for this one since EA showed us a prerelease version almost a year ago. *Return to Atlantis* (\$50, **512K Amiga**) has glorious stereo sound and movielike graphics, a real tribute to the capabilities of the Amiga. You are an agent for the Foundation, and you must complete 14 underwater missions. Each completed mission leads you closer to the secret of Atlantis. . . . Another EA game, *Wasteland* (\$50, **64K Apple**), takes us to the post-World War III American Southwest, a barren land inhabited by mutants, outlaws, and mon-

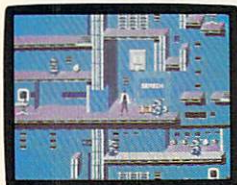
sters. Your mission, pure and simple, is survival. . . . **Dan Buntin**, creator of *M.U.L.E.* and *Seven Cities of Gold*, has designed for **EA Sport of War** (\$35, **C 64/128**, **256K IBM PC**), a war you can wage on-line via modem. You'll find five levels of play and countless battlefields. Take on a remote opponent or battle against the computer. Have modem, will fire! . . . And **Lucasfilm Games** has released *Strike Fleet* (\$30, **64K Apple**, **C 64/128**, distributed by EA), a naval simulation that puts aspiring commanders in charge of a modern naval force and sophisticated weaponry. (See review of *Strike Fleet* on page 76.) Commanders will be able to control up to 16 naval warships and four helicopters. Scenarios include conflicts in the Persian Gulf, the Falklands, and other international hot spots.

★ From **Sierra On-Line** comes *Manhunter: New York* (\$50, **512K Amiga**, **128K Apple**, **512K Apple IIGs**, **256K IBM PC**, **512K Macintosh**), a sci-fi adventure that takes place two years after an alien invasion and a world takeover. New York City has become a walled-in prison, and you are the prison warden. . . . And there's talk at Sierra On-Line about a sequel to

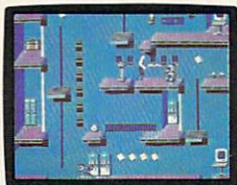


IF THIS IS THE FUTURE, THEN YOU'RE HISTORY.

Hold it. What's this? Human-seeking suicide robots? An evil mastermind



There are 8 office towers to search, each with its own theme and level of difficulty.



Of course, Elvin's floor plans are almost as complicated as his global plans.

bent on world annihilation?

No wonder they call this mission impossible. Why, it's got even more strategy and action than the original top-selling Impossible Mission™.

The trick here is to collect the

secret code numbers that will ultimately allow you to access Elvin's stronghold. And waste him before he wastes the world.

There are over 50 rooms to search for codes. Careful. The floors and catwalks in this place end a little abruptly. And of course, they're guarded by those pesky bots. But you've got an MIA9366B pocket

computer to help you crack the security code. A working tape player to play music clues. And a map to show which towers you have or have not searched.

Go then. Elvin is preparing to launch his missile attack in less than ten hours. You must stop him. Or the world will be terminally late for dinner tonight.

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FC-5/88

ENTERTAINMENT

Police Quest, as well as a third chapter to *Space Quest*. We'll keep you posted.

★ **Chris Crawford** (of *Balance of Power* fame) talked with us briefly about his most recent game, *Trust & Betrayal: The Legacy of Siboot* (\$50, 512K Macintosh) from **Mindscape**. Those of you who might be wondering how the characters of Kira came about will be interested to know that the characters are based on Crawford's various pets. Skordokott and Vetvel are based on two of Crawford's cats, Scaredycat and Velvet, and Locksher is really Sherlock, his sheep.

—LISA WU

GAME HINTS

INFILTRATOR II (Mindscape). In this helicopter simulation-arcade game, you are "Jimbo Baby" McGibbits. You must fly your Gizmo DHX-1 Attack Chopper behind enemy lines and complete three ground missions to defeat the Mad Leader and save the world. (64K Apple, C 64/128, 128K IBM PC)

The following hints are for Mission One:

★ If you don't know a pilot's loyalties, the worst thing you can do is nothing. If you ignore him, he will attack. If you use *Infiltrator* or *Overlord*, you'll have a 50-50 chance. If missiles are launched at you, you guessed incorrectly.

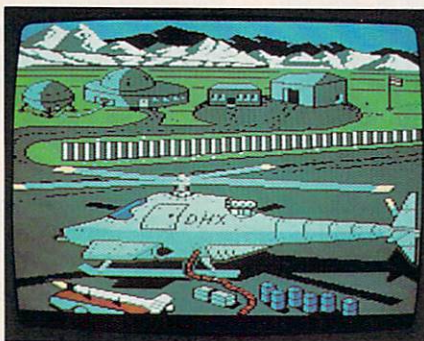
★ Jimbo never bothered to take swimming lessons.

★ If you like hiking in forests, use a special item from your inventory, or you may step on something very destructive.

★ You'll need to unlock doors to get into special rooms. You can find the security card in the first building you see. You should use the security card in the security control room (not necessarily in the same building). You'll know you're in the security control room if you're able to change the light from red to green by inserting the card in the slot.

★ If you set off the alarm, the electronic key is useful for turning it off. But you'll have to search high and low for the key.

★ You'll have less trouble with the guards if you change your uniform.



Pilot your DHX-1 behind enemy lines to defeat the Mad Leader in *Infiltrator II*.

★ If you're carrying chemicals, find the red room with chemistry formulas on the walls. Push up and touch one of the four sections of the wall. Repeat this with other sections and chemicals to find something valuable.

★ As you're showing your papers to a guard, keep your finger ready to press the "S" key—just in case.

★ After you gas a guard, leave before someone sees the unconscious guard or he regains consciousness.

★ Don't walk away from a guard when he's asking for your papers.

★ If you drink any vodka, your movements will be impaired for a short time.

★ Getting caught rummaging through items in the Mad Leader's installations is a very serious offense. On the other hand, if you don't get caught . . . —JIM FREY, Webster, New York

SPACE QUEST II (Sierra On-Line). Join the ongoing adventures of our favorite sanitation-engineer-turned-space-hero, Roger Wilco, as he encounters new disasters on the trail of the sinister scientist Sludge Vohaul. (512K Amiga, 512K Apple IIgs, 512K Atari ST, 256K IBM PC, 512K Macintosh)

★ Be sure to clean out your locker before you set out on a long trip. You wouldn't want to be caught short!

★ The key to your freedom from the monster's cage is a spore that you'll find before you cross the swamp.

★ Pretend you're Tarzan when you meet up with the gorilla.

★ Whistle while you work when trying to get through solid rock.

★ There's light at the end of the tunnel. Just hold your breath and you'll find it.

★ Use your head before entering the black hole.

★ Attracting too many undesirable swamp beasts? Dab on a little "un-berryable" cologne.

★ To avoid wrestling with an alligator in the muddy swamp, it's best to take a dive!

★ You won't live to kiss and tell if the kissing alien lays a "smoocheroo" on you.

★ When it seems as if the walls are closing in on you, stay above water with your handy-dandy plunger!

★ The swamp holds more than just a terrible beast.

★ Take the plunge(r) in the acid trap.



You are Roger Wilco, the sanitation-engineer-turned-space-hero in *Space Quest II*.

★ Smokey the Bear would not approve of the way you stop the Wallbots.

★ It takes two tries to get into the escape pod. Also, it's easier if you pick the right one.

★ Go for a whirl in watery warrens.

★ Vohaul's heart would stop if he knew what little you were up to.

—ROBERT BELLONE and JEFF DONAHUE, New York, New York

TOWER OF MYRAGLEN (PBI Software). You are a brave knight who has set out to obtain the mystic medallion that is in the Tower of Myraglen. Along the way, you must overcome obstacles and solve riddles in order to escape from the Tower with the medallion. (512K Apple IIgs)

★ Level One: To get past this level,

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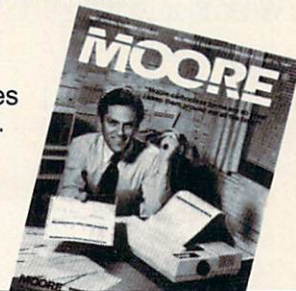
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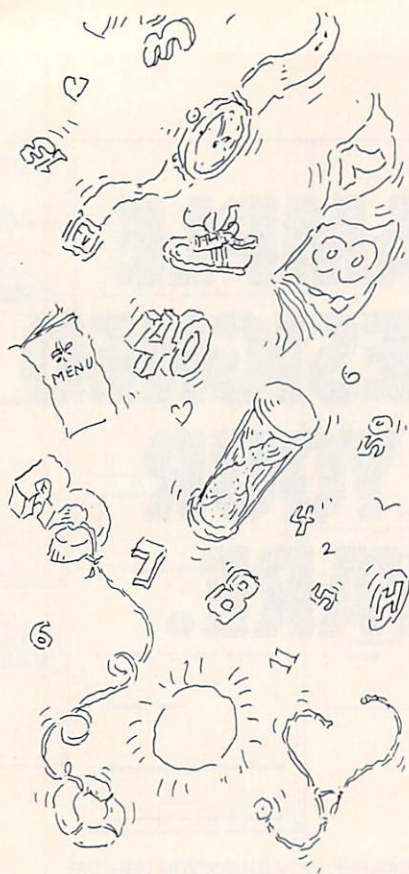
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either set your clock ahead to 12 p.m. or actually play the game at that time. To find out about this time constraint, go to the room with the live skeletons. Kill them, and then search in the scorched curtains. Also, go into the room with the Slime (it can't hurt you if you are armor-clad) and get the key from the chest. Before opening the iron door, make sure you have read the magic mirror.

★ **Level Two:** Avoid the noise; remember the mystic words of command; and find the secret door in the right-most tunnel. Say the words to the monolith and retrieve the key.

★ **Level Three:** Use the Look option frequently; there are numerous traps. After you are inside the first door, walk straight through the next door. There will be no more traps. Be sure to open the chests in the room of water and in the room directly above the middle passage. Go through the southern passage when you are finished.

★ **Level Five:** There are many answers to the riddle. One answer is the vocation of the game designer. Search everywhere on this floor. Give large quantities of gold to the needy. Fight the snakes and look for many doors.

★ **Level Six:** Don't take anything from the chest in the room marked "I reward your endeavors with a gift of defense." The medallion in the chest in the secret room is fake; don't bother bringing it to the king. From now on, secret doors will be numerous. Also, don't go north of the room with the voice.

★ **Level Seven:** On this level, you only need to go to the teleporter. There is no mystery, but you must get the music box and the jeweled key.

★ **Level Eight:** After you step off the teleporter, you'll see a bridge. Follow these instructions; otherwise death awaits you:

1. Look forward.
2. Take a step forward.
3. Repeat steps 1 and 2 until you are off the bridge.

On this level, your main task is exploration. However, be sure to retrieve the potion of power and two jeweled keys.

★ **Level Nine:** You need all five jew-

eled keys that you have found. Once inside, go straight; there is a secret door around the torches.

★ **Level Ten:** Don't bother the wicked sayings at the hall of many doors, but use the jeweled music box to put the dragon to sleep. Also, be sure you have the ring of fire resistance. The hall of coins is useless, so go south. At the end of all the chambers, say "no." A secret door will open and you will come to a dying Mendalick. Take the medallion.

—KRIS OLSSON, *San Francisco, California*

CONVERSIONS

The Bard's Tale II: The Destiny Knight (Electronic Arts). Now available for 512K Amiga. Already out for 64K Apple and C 64/128. Reviewed in July 1987 issue.

Chuck Yeager's Advanced Flight Trainer (Electronic Arts). Now available for 64K Apple. Already out for 256K IBM PC and C 64/128. Reviewed in November 1987 issue.

Gauntlet (Mindscape). Now available for 64K Atari and 256K IBM PC. Already out for 512K Atari ST and C 64/128. Reviewed in February issue.

Plutos (Mindscape). Now available for 512K Amiga. Already out for 512K Atari ST. Reviewed in December 1987.

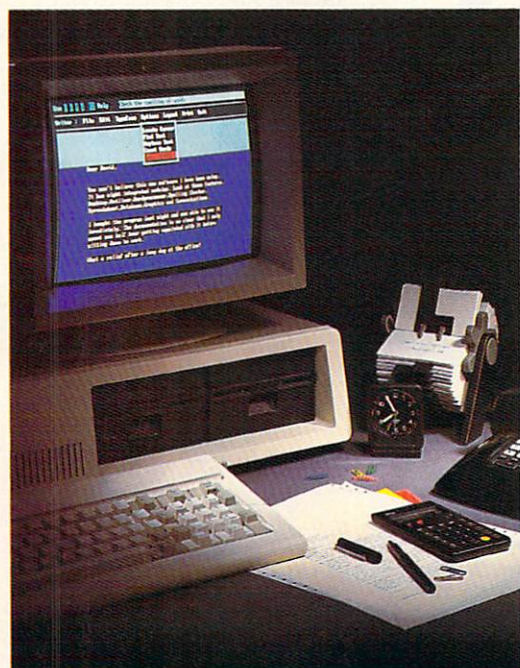
Q-Ball (Mindscape). Now available for 512K Amiga. Already out for 512K Atari ST. Reviewed in November 1987 issue.

World Tour Golf (Electronic Arts). Now available for 512K Amiga. Already out for 512K Apple IIGs, C 64/128, 256K IBM PC. Reviewed in March 1987 issue.

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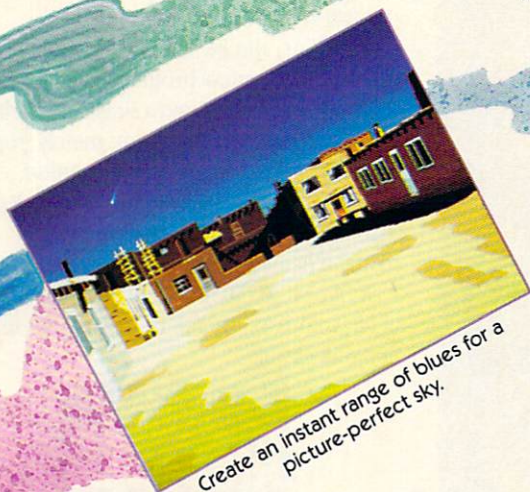
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20 Building Blocks for a Successful Home Business

QUESTIONS TO ASK AND
ADVICE TO FOLLOW TO GIVE
YOUR BUSINESS A SOLID
FOUNDATION

BY LIS FLEMING

Build your home business as you would build your home—on a sound foundation. This old advice comes as news to many entrepreneurs.

Experts generally agree that about two-thirds of all new businesses (half

Contributing editor LIS FLEMING, who teaches in Davis, California, consults in telecommuting and home-based work. Her two-part series "Insurance for Your Home Business" concludes in this issue.

of which are home-based) fail in the first few years. Why? Lack of solid business building is often at the heart of the problem. Insufficient start-up money, poor market research, uncompetitive pricing, inadequate rapport with customers—these are just some of the traps that catch unwary entrepreneurs.

The lesson learned is that a home business needs the same careful planning as any other business. At

the very least, sticking to the basics should keep you from throwing good money after bad. If one of the foundation blocks doesn't fit snugly in place, it's better to know before you spend too much money.

Take a look at these 20 basic building blocks for laying a strong foundation for your home business. Remember that business building begins at least six months before your doors open to the first customer.

1 KNOW THYSELF



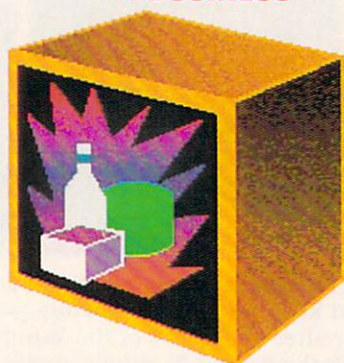
You are the cornerstone of your business. Your interest, enthusiasm, energy, skill, time, and effort make a new enterprise happen. Therefore, get to know yourself before you make any decisions, including the kind of business to start.

Skills. Inventory your skills. Submit a resumé to yourself, and don't be shy. List all work experiences. List all skills that could be used in a business. Write down all volunteer work, hobbies, activities, and education (formal and informal). Put a check by strong skills.

Likes. Inventory your likes. What would you do for free? How do you spend your days off? Do you like helping people? working alone? gardening? writing? animals? computers? This list will give you a feel for the kind of business in which you would be successful.

Now look over your two lists and make a third list of your strong skills and strong likes. This final list will provide you with a good basis for deciding the type of business to start.

2 SELECT A BUSINESS



Some people start out knowing exactly what kind of business they want to run. Others just feel it's time to head out on their own without a clear business direction. But even clear or obvious business ideas should be tested against market conditions.

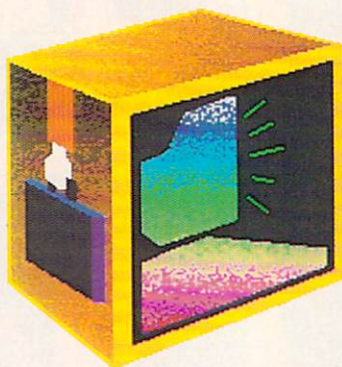
Business Ideas. Rule number one in

being successful is choosing a business you like and are willing to work hard at. Based on what you learned from your self-inventory, make a list of businesses that interest you. Think about what others have said you should try, ideas you have read about. Look for businesses where your skills fit without major retraining.

Above all, there has to be a need for your product or service, and people must be willing to pay for it. Make a list of problems and aggravations that bother people. Do you have solutions to these problems? Which of these solutions are people willing to pay for? How much are they willing to pay?

Test the Idea. Look in the Yellow Pages, newspapers, and magazines. Are there dozens of businesses offering your product or service? If so, there may be too much competition. Is no one else offering your product or service? Why not? Perhaps you've hit on the brilliant idea of a lifetime that will make you rich and famous. Perhaps someone else has already tried the idea and failed. Ask around. Don't be surprised if your ideas change. Be open to making changes.

3 HONE YOUR SKILLS



Sharpen your business, computer, and communications skills before opening your doors.

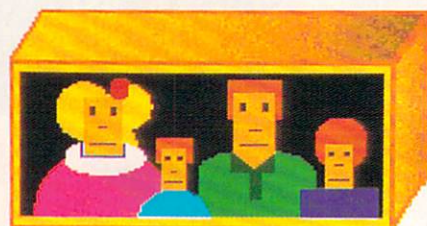
Business Skills. Business skills can be learned in numerous ways. Read books, take classes, attend meetings of business groups, and study services and products related to your aspirations. Observe a similar business during working hours—you'll learn a lot! The more familiar you become with the day-to-day workings of a business, the better your chances for a successful start.

Computer Skills. Good computer skills are a matter of survival if your business depends on your computer.

Install and learn to use your software, printer, and modem. If the software doesn't do what it should, switch. As you practice, try to discover problems and learn how to solve them before you encounter them on deadline.

Communications Skills. Read a book or take a class in business writing. Learn to make sales presentations and to use good telephone techniques. Study business letters for style and content. Sound-record or videotape yourself in action. Be sure you represent someone with whom you'd want to do business.

4 ENLIST FAMILY SUPPORT



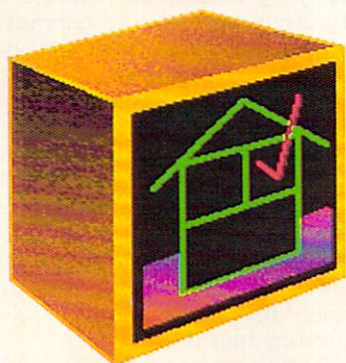
Enlisting the support of your family is necessary for success.

Set Aside Time. All entrepreneurs find that a new business takes more time than they originally expected. That often means families won't see them many evenings and weekends while they're putting in extra time. If family members are not expecting this or if they're not enthusiastic about the new business, the stress can be severe and damaging to the family and to the business.

For the home-based entrepreneur, family support is even more important. Not only is the entrepreneur's time and attention going to the new business, but space in the home is taken and restrictions are often placed on what others can or cannot do during "business hours."

Family Meetings. Hold meetings to discuss the changes the business will bring to the household. Talk about both the ups and downs. Visualize what the situations might be like. Talk about how other family members might be part of the business. Set rules about the use of telephones and hours when noisy activities can't be allowed. Find solutions to prevent conflicts. Headsets for televisions and radios, locking doors for the home office, bulletin boards for posting work schedules, and daily "break" times for visiting with the family can be very helpful.

5 SET UP A HOME OFFICE



Books, magazines, and office-furnishings catalogs offer much advice and many choices of equipment, ergonomic furnishings, and lighting for your home office. Following are some basic requirements.

Physical Requirements. Find a work space that is quiet, away from household noise and traffic. Be sure there is good light. Natural light from a window, soft overhead incandescent lighting, and strong task lighting will give you the right combination. Situate your monitor so you reduce eye strain caused by glare from windows or other light sources. You'll need enough floor space for your equipment, storage, and desk or other work surface. You should be able to spread out your work without having to push aside stacks of books and papers. Be sure you have adequate electrical and telephone outlets. In most homes, "twisted pair" wiring for a second telephone line will already be installed. Eventually, you'll need this second line for a modem or fax phone.

6 CHECK ZONING AND RESTRICTIONS



A sound business foundation means keeping your place of business in compliance with laws and regulations.

Zoning. Communities have zoning ordinances for home-based occupations. You can get a copy from your city or county offices. In some places, outdated ordinances prohibit any kind of business in residential areas. Your recourse in such a case is to apply for a variance or try to amend the ordinance. Operating a business in violation of zoning ordinances can result in an injunction to cease business on that same day. You'll either have to stop your business, file an appeal the same day, or face penalties of several hundred dollars in some states.

Neighbors. Usually, however, zoning restrictions are based on nuisance laws—how will your business affect the neighbors? If your business doesn't bother the neighbors, it is usually permitted. This generally means no increased traffic, no noise, no dust, no odors, no vibrations, and no exterior displays, such as shop windows, large signs, or outdoor storage. Most computer-based home businesses fall well within these restrictions.

CC&Rs. Conditions, covenants, and restrictions (CC&Rs) in the deed to your house may sometimes prohibit business use of your home. This is especially true in exclusive neighborhoods with homeowners' associations. If your home business is your sole source of income, you'll want to get special dispensation from the association, amend the restrictions, or, as a last resort, move.

7 MAKE THE BUSINESS LEGAL



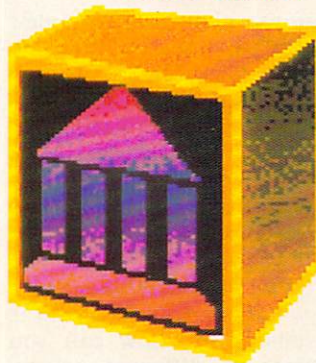
Before you apply for a business license, you must decide on the legal form of your business. There are three basic forms from which to choose. The most common is the sole proprietorship. An individual or a married couple is the owner and

is solely responsible for any liabilities of the business. This form is used for most home businesses. Partnerships and corporations are legal forms not usually recommended for small businesses.

Business Name. Choose and register your business name. The name should indicate what you do, be short, and be easily remembered and spelled. "Wilson's Typing Service" is a business name that fits these criteria. If you choose a fictitious name, such as "Executive Typing Service," you'll have to pay an additional filing fee and the cost of running a fictitious name announcement in a local paper.

Business License. Get your business license from the city or county in which you live. You may need a resale license for collecting sales tax on products if you are selling retail. Check into any other permits required by your local or state government. Fees for licenses and permits are considered business expenses and are tax deductible.

8 ARRANGE BANKING AND CREDIT



It's absolutely necessary to establish a separate bank account for your business. You'll need a copy of your business license and fictitious name permit (if applicable) to open your account. You can use a personal type of checking account for your small business. A commercial checking account can be expensive and may not be necessary for your needs. Invest a few extra cents for a "safety" check that looks more businesslike and has room for both your personal and business name. Consider buying a one-write check system.

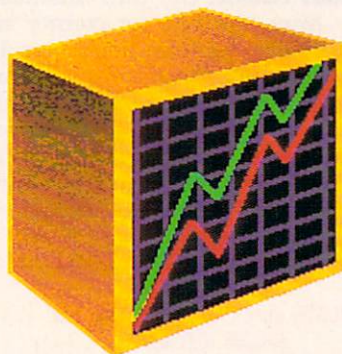
Vendor Credit Cards. Find a bank or other financial institution that is big enough to provide the services you need, yet small enough to value your business. Look for a bank that will provide you with vendor credit-card service if your customers will be pay-

ing you by credit card. Not all banks offer vendor credit cards to home-based businesses.

Getting Credit. You can use your personal credit to build your business credit. Have local suppliers bill your business for small monthly purchases. You can also get a free Dun & Bradstreet (D&B) rating for lines of credit with suppliers, wholesalers, and manufacturers. Consult the Yellow Pages under credit-reporting agencies. Loans to small businesses are usually personal loans and sometimes require cosigners.

9

WRITE A BUSINESS PLAN



Your business plan is an overview of your entire business, with both short-term and long-term planning. It also contains specific plans for operations, marketing, distribution, and finance.

Focus. Narrow your focus. What exactly does your business do (and not do)? Write a 25-word description of your product or service. What are your geographic limits? What specific need does your business fill? Who is your best customer? How can you provide better or different service from your competitors? Why should customers prefer dealing with you?

Operations. Put on paper the logistics of how everything will be done. Who will take and fill orders? Who will provide the service? What equipment and supplies will you need? What space will you need? How much time will it take to fill an order or provide a service? Who will keep records? What outside support services will you need? What transportation will you use? Where will you buy supplies and materials at good prices?

Marketing. Do your market research. Who are your ideal customers? How will you reach them? What kind of advertising will you use? How much will it cost? How much time will marketing take? What public-relations methods will you use? What business materials will you need?

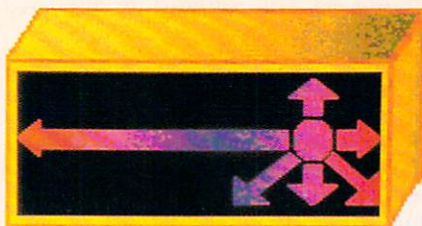
(See building block 10.)

Distribution. Look for cost-effective methods. How will you deliver your product or service? Will clients come to you? Will you pick up and deliver? How will shipping and handling be paid? How much turnaround time will you need? Will you need a car or truck?

Finance. Determine the capital you will need and project your income. How much money will you need to start? How much will it cost to operate your business monthly? How will you price your product or service? How much income do you need each month? How much income can your business earn in a month? How long until the business supports itself? What could go wrong? What would you do if the business failed? (See building block 11.)

10

WRITE A MARKETING PLAN



In the beginning, you'll spend the majority of your time marketing your business. Start-up entrepreneurs estimate spending up to 75 percent of their time securing business. A good marketing plan helps you to spend that time wisely with a clear purpose in mind.

Focus on the Customer. Again, define your ideal customers. Where do they live or work? What, when, how often, how much, and why do they buy? How much do they spend on similar items? Are they business buyers or personal buyers? What other purchases might compete for their dollars? Do they value discounts or high quality? Is time or money more important to them? What emotions stimulate them to buy your product or service? Use census demographics, test ads, phone surveys, and the experiences of others to help you find the answers.

Develop Materials. Using your knowledge about your best customer, choose the colors, words and shapes to be used on your business card, stationery, envelopes, brochure, fliers, catalogs, and future ads. Keep these materials to a minimum at first, testing them for effectiveness.

Quality, one-color printing on a good grade of paper is available at reasonable prices and presents a professional image.

Marketing Techniques. Consider listing in directories such as chamber of commerce listings and the telephone Yellow Pages. Evaluate advertising techniques such as fliers, door hangers, classified ads, display ads, radio, TV, telemarketing, and direct mail. Use public relations methods such as news releases and public appearances. Teach seminars. Do publicized work for worthy causes. Consider such outlets as trade fairs, sales representatives, direct mail, catalogs, and on-line marketing.

Marketing never stops. Even when business is rolling in, a level of marketing must be maintained. Keep in touch with repeat customers and find ways to attract new customers. Personal telephone calls and preferred customer mailings are ways to let customers know you appreciate their business.

The Satisfied Customer. No matter how slick your advertising is, a satisfied customer is your best marketing resource. Being sure the job is done right and delivered on time in a positive and professional way builds goodwill and a good reputation. Some businesses rely entirely on word-of-mouth referrals from satisfied customers.

11

WRITE A FINANCIAL PLAN



Your bottom line is making a profit. The only way to know if your business idea can make money is to project income and expenses.

Financial Planning Worksheet. Begin with the first year. Itemize one-time start-up costs and ongoing monthly operating expenses. Check around to see what the actual costs are rather than guessing at the figure. Multiply your estimated total operating expenses by three—to be safe.

Go on to do worksheets for the third and fifth years. List initial costs of providing new or expanded services under start-up costs. Include monthly costs for new services under operating expenses.

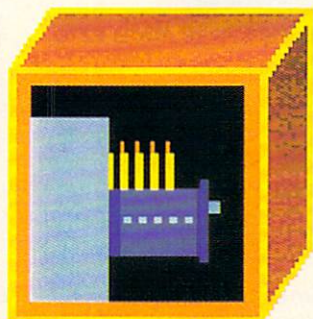
Cash Forecast Sheet. Do a mock-up of projected income and expenses for each month of the first year. Take into account how many hours a week you'll be working, how many of those hours will be "billable," what prices you'll set for your product or service, and how much you expect to sell each month. As the year progresses, you'll increase your number of "billable" hours and amount of sales. Put a big star on the month you expect to break even—when your income pays for all your expenses. After that month, you should begin to earn a profit and be able to pay yourself for your hard work!

Profit-and-Loss Statement. Write projected profit-and-loss statements for the first five years of business. This exercise will present the big picture, and you'll know if your idea has the potential to make money.

Funding Sources. Most entrepreneurs begin with money from a savings account, extra money from the budget, income from extra jobs or overtime, and sometimes donations or loans from family and friends. Loans from financial institutions are, as a rule, not recommended at this stage.

Your worksheets should be reviewed and modified at least twice a year or as often as things change. A financial plan is never finished—it changes with the customer, the economy, the competition, and the modifications to your business.

12 SET UP A RECORD-KEEPING SYSTEM

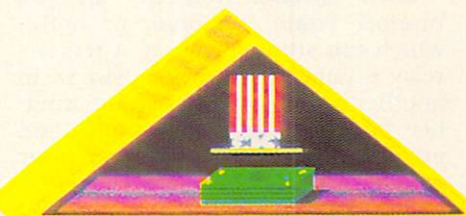


Setting up a record-keeping system at the outset can prevent frustration later.

Setting up a System. A good place to start is with IRS pamphlet 583, *Record Keeping for Small Business*. Consult with an accountant (for about \$75 an hour) to establish your chart of accounts. Then consult with a bookkeeper (about \$25 an hour) for the actual setup of your books. Thereafter, you may want to keep your own books, or you may prefer to hire an outside bookkeeper. Home-based accountants and bookkeepers will be most useful because they have already explored the needs of a home-based business for their own use.

Handling Receipts and Invoices. Set up a regular routine for handling papers. Have a designated place for storing cash receipts, sales invoices, expense invoices, and credit invoices. File these in their assigned place every day. Keep them in an envelope, a cash box, or even a marked shoe box—not in pockets, wallets, or glove compartments. Keep a mileage log in your car for recording your deductible travel expenses.

13 PLAN FOR TAXES



Much of your record keeping is related to federal and state taxes. To get some background, consult IRS publications on tax planning for business.

Quarterly Filing. If you're self-employed, as soon as your annual profit exceeds \$400, federal taxes must be prepaid quarterly, based on projected income. Taxes are due on the 15th of January, April, June, and September. You'll use Form 1040ES if your business is a "sole proprietorship."

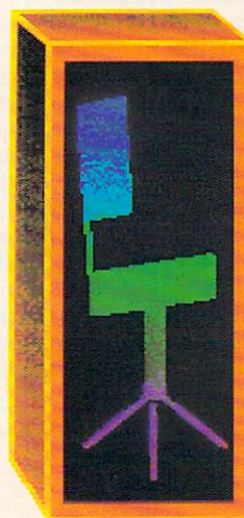
Home-Office Deduction. To learn how to qualify, read IRS Publication 587 (*Business Use of the Home*). The basic rule for qualifying is to prove your home office is used exclusively for business.

Self-Employment Tax. On this Social Security tax for the self-employed, the current rate is 12.3 percent of your net income up to \$43,800, with a proposed increase for 1988. Wages to children younger than 21 are still exempt from this

tax. Double-check with your accountant or tax consultant to learn of changes in tax laws.

Retirement. You may also wish to establish an Individual Retirement Account (IRA) or a Keogh plan as part of your financial and tax planning. Setting aside tax-deferred retirement funds in such accounts can reduce the amount of income tax you'll currently have to pay. Ask your accountant or tax planner about this possibility.

14 PURCHASE EQUIPMENT AND FURNISHINGS



For many, purchasing is the "fun" part of setting up a business. Now that you've done your financial planning, have a good time shopping (or scrounging) for your home office.

Furnishings. You'll need a large working surface. Don't use a folding table to support your computer! Find a sturdy table or desk with solid support. Get a strong office chair with good ergonomic design to prevent backaches. A computer stand or keyboard shelf will keep your keyboard low enough for comfort and prevent pain in the wrists. File and storage cabinets and plenty of bookshelves will keep your projects and supplies accessible. Don't forget good task lighting.

Software. Every business needs a word-processing package. Many also need a good database for tracking clients and producing mailing labels. Research and select your specialty programs as you learn your computer skills. Buy only what you need to get started; you can add extras as you go along.

Computer Equipment. Find the com-

puter that you're comfortable with and that will handle the software you've chosen. For business use, your computer will need two disk drives (one floppy and one hard) and at least 640K RAM, preferably 1MB.

Printer. Every business needs a printer. Dot-matrix printers are fast and used for mailing labels, memos, drafts, and transcription. The 24-pin dot-matrix printers can be used for business correspondence. A letter-quality printer (daisywheel) is slow, but produces professional-looking type appropriate for letters and reports. Laser printers are relatively expensive but produce results of near-typeset quality.

Home-Office Equipment. If you'll be sending and receiving work and messages from customers on-line, you'll need a modem (internal or external) and communications software. If your work requires daily use of a copier in such a way that work must stop until a copy can be made, you'll want to invest in a personal copier. If instant turnaround to distant customers is important to your business, a facsimile machine may be a necessary investment. A typewriter is great for addressing envelopes when your printer is busy. Your telephone deserves a section all to itself.

15 FINE-TUNE YOUR TELEPHONE SERVICE



The telephone is your lifeline to the business world. Get a quality instrument with clear sound and any other extra features you find necessary to do business efficiently. A phone with memory for automatically dialing multiple-digit numbers can be especially helpful.

Separate Line. If at all possible, get at least one separate line for your business. In this way the family has uninterrupted use of the family line. There are advantages for your business as well. You'll have a separate record of business-call expenses, and it will be easier to prevent children from answering business calls. To-

day, most homes are wired for at least two lines, and you can easily arrange to have a second residential line connected. If you want to be listed in the Yellow Pages, it's necessary to install a more expensive, commercial line. A two-line phone with a hold button is an efficient way of managing calls.

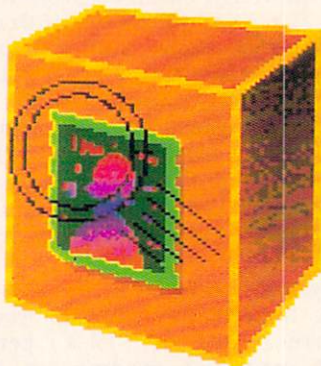
Of course, if you plan to use a modem or facsimile machine regularly, you'll need an additional line anyway.

Answering Machine or Service. Decide how you'll handle calls when you're not in your office. Answering machines are gaining acceptability as people become accustomed to them. Choose one that is voice activated and allows your callers to finish speaking before it "beeps" them off.

Another choice is to call-forward your incoming calls to an answering service. Professional services are listed in the Yellow Pages. You'll want to ask for client references, as not all answering services will meet your needs. Another option is to arrange call-forwarding to a neighbor or another home-based business in your area. You can pay them to take messages and to set appointments for you. To use a call-forwarding device, you need two phone lines.

Other Options. Consider an 800 number (state, national, or both), which can stimulate sales. A remote-relay number lists your business in another city with a local phone number for that city. The volume and amount of your sales will determine whether or not these are cost-effective options for you. Voice mail and electronic mail are other possibilities to keep in mind.

16 ARRANGE FOR MAIL AND DELIVERY SERVICE



It's acceptable to use either your home address or a post-office box number for receiving mail.

Post-Office Box. A post-office box offers more security. You can rent a box at a branch post office or rental center near your home. Rental centers often have United Parcel Service (UPS) and Federal Express available as well. If you rent a post-office box, be sure to get one that is large enough to accommodate the increase in mail as your business grows.

Deliveries. Stay on good terms with your mail carrier, who will be delivering more than the usual number of letters to your house. You can make special arrangements with your carrier about delivering parcels when you're not home. UPS will pick up parcels at your home by prearrangement. Federal Express will pick up letters and parcels the same day you call in.

Lock Box. If servicing clients, a business generally provides pickup and delivery to the customer. However, some business owners have attached lock boxes to an exterior wall of their homes. Customers are issued a key and can drop off work to be completed and pick up finished work without having to go inside.

17 INSURE YOUR BUSINESS



The amount of insurance you'll carry on your home business depends on the needs of your particular business. Contact a local independent insurance broker who likes to work with small businesses. Go over the following basic coverages with your broker.

Homeowner's Endorsement. See about adding a rider to your homeowner's insurance to cover your computer equipment and business furnishings. Most homeowners' policies

don't automatically cover business property. Discover other kinds of insurance that you may need, such as non-owned auto, theft, computer data, workers' compensation, or malpractice insurance. (See April and this month's issues for the two-part "Insurance for Your Home Business.")

Group Insurance. If you are self-employed, look into group coverage for health, dental, and life insurance. It's possible to join trade and health organizations that offer these kinds of insurance to members. Ask your broker to suggest organizations.

18 SCHEDULE WORK HOURS



Arrange a work schedule for yourself that is as regular as possible.

Self-Discipline. Self-discipline is needed to work at home. Learn to avoid interrupting business to attend to household tasks. Learn to avoid procrastination; go into your home office at the scheduled time and get to work. Learn to say no to unwanted interruptions from neighbors or family.

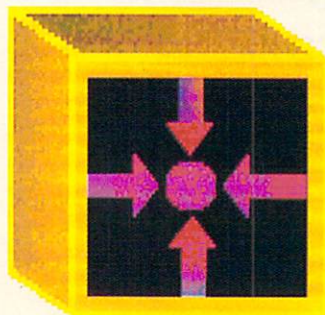
Overworking. At the other end of the scale, self-discipline is needed to avoid overworking, a habit prevalent among entrepreneurs. Shut the doors to the office and hang up a "closed" sign if necessary! And don't be a superparent, trying to care for toddlers while you're working. Arrange for child care during your work hours.

Use your own peak time (be it early mornings or midnight sessions) to produce work. You'll often get more done in four hours of peak time than in eight hours of non-peak time.

Set Priorities. The key time-management skill is to prioritize your activities. Do those tasks that are most important to your business first. If you still have more than you can possibly handle, you may need to modify your business. If your business in-

come allows it, hire other small businesses to provide you with data entry, delivery service, or record keeping.

19 FIND BUSINESS RESOURCES



Your business cannot stand alone. It must be supported by the resources of the business community. Find and develop those resources.

Publications. There are many publications to help you find the resources you need. Local newspaper ads, the telephone book, and the chamber of commerce directory all list businesses that offer support and backup services such as photocopiers, printers, bookkeepers, and delivery services. Newspapers carry local meeting calendars for helpful organizations such as entrepreneurs' groups, small-business groups, trade organizations, and computer users' groups. Look through directories in the reference section of your local library for trade organizations, newsletters, trade shows, and conventions. Send for inexpensive brochures and pamphlets from public agencies such as the Small Business Administration (SBA) and the Internal Revenue Service (IRS).

People. Your most valuable resource is people. Individuals in your community can provide you with local information and referrals. People in businesses in other cities and states can give you leads and helpful advice, especially by telephone and by modem. By referring customers to your "competition," the "competition" will make referrals back to you. Calling to sincerely congratulate others or ask for their opinions builds relationships that help your business grow.

Those who are most successful in business communicate well with others and understand the give-and-take of business relationships. Get to know people. Get to know how business deals are made. Support others, and they will support you.

20 KEEP A POSITIVE ATTITUDE



Have fun! It's the key to success when you run your own business. Hard work is fun if you like what you do. Your good spirits will help you get and keep customers. People like to do business with people who make them feel good.

Service with a Smile. Top-quality work and service go along with feeling good about yourself and your business. Caring about your customers' needs and feelings must be your number-one priority. Promise what you know you can deliver, and then deliver it on time, in correct form, and with a smile. Correct mistakes readily and immediately. Charge customers the agreed-upon price, even if it took you twice as long as you expected. Next time, you'll know what to charge. Never complain to your customer; take care of problems quietly and professionally.

Emotional Ups and Downs. Expect roller-coaster emotions. Entrepreneurs have high days and low days. If you're aware of that ahead of time, you'll be prepared. Feeling low does go away! The trick is to keep working through those days. You'll feel great when you get paid for your work. Landing a new account will set your spirits soaring again.

Expect to feel some discomfort about selling. Many people just aren't used to it. The worst thing that can happen is that the customer will say no. Expect customers to say no the first time—they usually do! That doesn't mean they won't say yes later. Be positive!

SOLID AS A ROCK

Use these 20 basic blocks to build a strong home business. The time and effort spent will be worth it. Once your building blocks are in place, you'll be ready to open your doors for business with confidence. You'll attract clients and do a good job for them. Building a solid foundation is your key to success. ■

Home-Based Franchises

INSTEAD OF STARTING A BUSINESS FROM SCRATCH, YOU CAN BUY INTO A PROVEN MONEY-MAKING SYSTEM

BY LYNIE ARDEN

With the rise and growth of the interstate highway system in the 1950s, a new business distribution method took shape—franchising. Holiday Inns, AAMCO Transmission Centers, and McDonald's hamburger restaurants began to dot the American landscape. Now, these and other cookie-cutter storefronts and fast-food outlets are instantly recognizable as we whiz past them at every freeway intersection and exit. More than 3,000 franchisees topped \$600 billion in annual sales in 1987.

But today, the widespread use of computers and the slow switch from a manufacturing to a service economy are helping to change franchising just as the growth of highways helped create it. An increasing number of franchises are home-based businesses instead of familiar highway storefronts. How is this possible?

"We are moving more and more from hard products to soft products, more from retail to service sales," says Paul Stewart, a nationally recognized franchise consultant who, for nine years, has been lecturing on the subject for the Small Business Administration through university workshops. Stewart has advised more than 30,000 potential franchise owners. "The fastest growing franchise is one that is service oriented, and that often means that the business can be run from home as well as—or better than—from a store-

front." Stewart speaks from personal experience, having run his own business from his home in Dallas for the past six or seven years.

BUY INTO EXPERIENCE

People favor franchising because it increases the chance for success. When you pay a franchise fee, you're buying someone else's experience. You're paying to avoid the time and effort of building a business through trial and error—an effort that may very well end in failure. Both the Small Business Administration and U.S. Department of Commerce statistics show a significantly lower failure rate for franchisee-owned businesses than for any other start-up.

The franchise fees for the businesses listed below range from \$1,000 to \$48,500. Besides the experience and training, your money often buys equipment, custom-designed software, a name backed with advertising materials, and a proven distribution system. Once the business is going, franchisees pay a royalty on earnings to the parent company in exchange for updated market research, training, advertising materials, and other tools of the trade.

The following descriptions of franchises are just a sampling of what's available in home-based franchise opportunities. All depend on computers to some extent, though previous computer background is not necessary in most cases. These particular franchises are all part of reputable companies, but you should always investigate a number of opportunities and evaluate them carefully before deciding to become involved.

BINEX franchisees are trained as business consultants who offer counseling and a broad range of computerized services for small- and medium-size businesses. Training is a mix of computer operation, software use, and management-counseling techniques. The BINEX system is based on an extensive library of business software the company has developed over a 20-year period. Franchisees use BINEX programs to provide general services including bookkeeping and accounting, customized financial reports, job costing, payroll, tax preparation, and personnel scheduling. BINEX also offers complete software packages that target specific businesses, from auto-parts stores to farms. It also produces a regular newsletter.

More than 60 percent of BINEX franchises operate from homes throughout the United States, Guam, and New Zealand. A franchise fee of \$11,500 is good for five years; after that, you pay \$1,000 per year.

(Contact Walter Heidig, President, 4441 Auburn Blvd., Suite E, Sacramento, CA 95841; [916] 483-8080.)

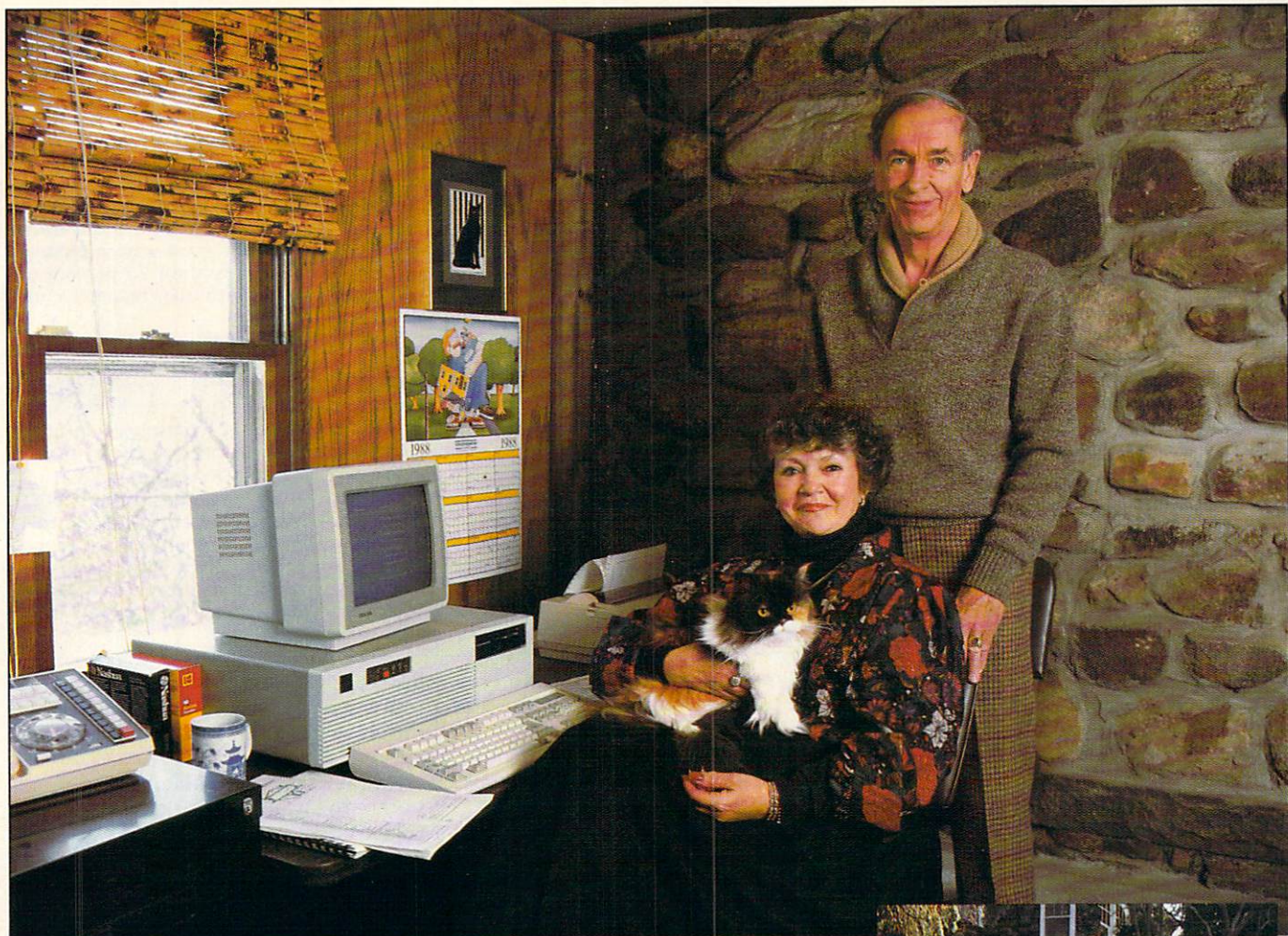
Thank God I've Found . . . (TGIF . . .) is a domestic-help search firm linking self-employed home help, such as housekeepers, nannies, companions, and the like, with average-income families. More than 90 percent of the franchise owners are home-based, which is unusual in the recruiting industry. "TGIF . . . works as a home-based business because we're dealing with families," says President Joanne Kobar. "We're talking to them on a very personal level. Also, we can provide extensive service that 9-to-5 storefronts can't. Our clients tell us that we are successful because they know they can reach us when they need us. People are hungry for that personal contact."

A typical workday in this business is spent talking to families seeking assistance and to job applicants looking for satisfying in-home positions. Custom-designed MS-DOS software helps the workday go smoothly. The franchise fee is \$8,500.

(Contact Joanne Kobar, President, P.O. Box 828, Old Lyme, CT 06371; [203] 434-1262.)

DEBIT ONE is a unique bookkeeping service with operations in 27 states. You could call it the home office away from home because Debit One is a mobile service. Bookkeepers go to their clients, rather than have clients come—laden with records—to them. How do they do it? By outfitting a Winnebago as a mobile, computerized office. The van has a gas-

Contributing editor LYNIE ARDEN, editor of *Workstader News*, wrote "Job Training and Placement for the Homebound" in the January issue.



FRANCHISE FULFILLS LIFETIME DREAM FOR TOM AND TERRIE DOYLE

In all the years he worked as a mechanical engineer for small companies, Tom Doyle always wanted to run his own company. In 1980, he bought a HouseMaster franchise in Congers, New York, which he now runs from home with his wife, Terrie. Two years later they bought a house with a whole floor dedicated to office space. That business worked so well that the Doyles bought a second franchise in 1985, in the adjoining county.

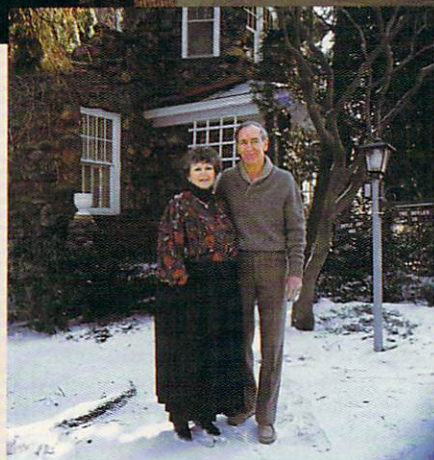
Tom, 60, and Terrie, 56, believe that succeeding in business would have been more difficult without a franchise. "It works because we have the strength of a national organization behind us, but we are free to run this as a mom-and-pop operation," says Terrie. "It's a nice blend."

Like most potential franchise buyers, Tom heard about HouseMaster from a friend. When Tom signed on (as the first franchisee), HouseMaster had 14 years of business success. "The presentation HouseMaster gave me made me feel like I

could succeed at the business," says Tom. "I was so impressed with the concept that it never occurred to me to say, 'I don't need to pay a franchise fee; I can do this on my own.'"

The franchise fee (\$5,000 in 1980, but now an average of \$20,000) bought the Doyles a business plan and a complete training program. Tom, like the other five engineers he's hired since, received training as a home inspector at company headquarters in New Jersey. "What we get for the 10 percent royalty we pay the parent company is just as important as that initial training," says Tom. "HouseMaster is constantly doing research and giving us updated materials. For instance, we had the information on radon long before the media picked it up. Independents don't have the facilities to keep up like that. It gives us a competitive edge."

Terrie, with a background in marketing and public speaking from her job with Bell Systems, was well equipped for the



HouseMaster brand of marketing. In a campaign designed to reach all people involved with real estate in a given territory, Terrie gives HouseMaster-designed presentations on its franchisees' home-inspection services to real-estate companies, lawyers, and civic organizations. "The marketing presentation is the crux of this business," says Terrie. "Learning an effective marketing technique alone is worth the franchise fee."

powered generator that supplies current for the entire system, which includes a Compaq computer and an Epson printer.

The \$48,500 franchise fee buys a

"loaded" Winnebago, plus two weeks of classroom and one week of on-site training, and follow-up assistance as needed. Franchisees are trained to offer bookkeeping, accounting, and

tax-preparation services to small businesses. Customers are receptive to the speedy same-day service and prefer keeping their records at the business site. Service owners set

their own fees and return an 8 percent royalty to the parent company.

(Contact Jack Dunn, President, 3433 South Campbell, Suite S, Springfield, MO 65807; [417] 887-0715.)

COMMUNIFAX is in the property-tax reduction business. It trains franchise owners and the hired consultants as professional real-estate appraisers. The franchise owner does not generally appraise houses; that's the consultant's job. The owner's job is to market the services, a fairly simple task because there's no charge to the customer unless the appraisal results in a tax reduction. In that case, the customer remits a predetermined percentage of the savings (50 percent to the franchisee and 20 percent to the franchisor). According to Communifax's President, Lewis Hill, Communifax has an "80-20 chance of getting a property tax lowered."

The property-tax reduction market is largely untapped. Communifax has openings in many areas for a franchise fee of \$25,000. Franchisees are discouraged from renting storefronts since this practice is an unnecessary drain on profits.

(Contact Lewis Hill, President, Graystone Centre, 3010 LBJ Freeway, Suite 205, Dallas, TX 75234; [214] 999-9222.)

HOUSEMASTER has devised a successful format for developing business in the home-inspection industry. "Franchisees don't have to know anything about housing, just have good business sense," says Ken Austin, HouseMaster chairman. The franchise owner receives training primarily in marketing and in the use of the company's customized *dBase III* database software, which is designed to streamline scheduling, bookkeeping, and report generation. HouseMaster trains the franchisee's inspectors in house-inspection procedures at the company headquarters in Bound Brook, New Jersey.

Home-inspection reports can be used by buyers to negotiate lower prices. In addition, new disclosure laws in many states are pushing the industry forward. Franchise fees range from \$17,000 to more than \$35,000, depending upon the number of owner-occupied homes in the franchisee's exclusive territory.

Since more than 90 percent of the work is usually done by telephone, HouseMaster discourages franchisees from renting office space. As a result, more than 75 percent are home-based. Doing business in this franchise is made simpler yet by requiring that clients pay at the time of

HOW TO EVALUATE A FRANCHISE

Franchise consultant Paul Stewart suggests taking the following steps before investing in a franchise:

Start with Enough Capital. The franchise fee is like an ante in a poker game—it gets you into the game, but doesn't make you a good player. Being undercapitalized will kill your business. Don't expect a full return on your investment for one to five years. A good franchise won't allow you to get into business unless you have enough operating capital to tide you over until you generate a profit (typically three to six months).

Choose a Growing Industry. Look at trade publications to see where the industry is going. Call association officials and listen to their views on the market.

Talk to Existing Franchisees. By law, every franchisor must give you a list of franchise owners. Call some of them, and ask: Are you making money? If you had to buy it again, would you? Are you getting the support that was promised to you in re-

turn for your royalty?

Evaluate the Opportunity. Though it may seem easier to buy a franchise in an industry you already understand, don't ignore opportunity elsewhere. Getting good training is the purpose of buying a franchise, so it can be a good way to change careers. In fact, more than 75 percent of franchisees are new to their respective industries.

Seek Professional Advice. Make sure that you understand the franchise agreement and that you can write a good business plan. In both cases, seek the advice of a trusted professional (a banker, accountant, lawyer, or business consultant).

Beware: Three Red Flags. Any of the following three are red flags that should make you pause or withdraw: 1) Promises of high income; 2) Franchisor not registered in your state (check with the Secretary of State); 3) High pressure tactics—franchisor doesn't want to give you time to think it over.

the inspection, eliminating the typical problems of keeping accounts and collecting money.

(Contact Ken Austin, Chairman, 421 West Union Ave., Bound Brook, NJ 08805; [201] 469-6565.)

MONEY MAILER is in the direct-mail advertising industry, which has grown 80 percent in the past five years. Using an eight-week cycle, Money Mailer sends envelopes full of fliers from local merchants and professionals to homes in target areas. It then tracks results as part of its service. Money Mailer's goal is to make marketing economically feasible for

local businesses. Co-op marketing is much less expensive than individual purchases of radio, TV, or newspaper space.

Franchisees use Macintosh computers to lay out ads quickly. The fast turnaround keeps advertisers happy. The franchise fee ranges from a low of \$15,000 to a high of \$35,000.

(Contact Chris Panaro, Director of Legal Services, 15472 Chemical Lane, Huntington Beach, CA 92649; [714] 898-9111.)

FINDERBINDER serves the public-relations business by publishing media directories and directories of clubs and associations. Most franchisees are already in public relations, so publishing FinderBinder is a big plus because it increases their credibility. FinderBinder can also be a stand-alone part-time business, in which case all income would be derived from selling the directories to the various professionals who use them.

The nominal fee of \$1,000 buys exclusive media book formats, forms, software, and continued guidance. Franchisees do the local research and produce the directories with guidance from headquarters. "Due to the ponderous number of entries in some directories, we had to develop a database-management system," says President Gary Beals. "Our affiliate here in San Diego produced a *dBase III* derivative that is so good the computer literally writes the book. People who aren't computer literate, though, couldn't handle this."

(Contact Gary Beals, President, 4679 Visto St., San Diego, CA 92116; [619] 284-1145.) ■

FRANCHISE RESOURCES

Evaluating Franchise Opportunities, Small Business Administration Publication #7.007. Free from any SBA office.

Franchise Opportunities Handbook, U.S. Dept. of Commerce, Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Lists 1,900 businesses and has annual updates. \$15.

How to Own and Operate a Franchise, by Steve Kahn, Longmeadow Press, Stamford, CT. \$3.95.

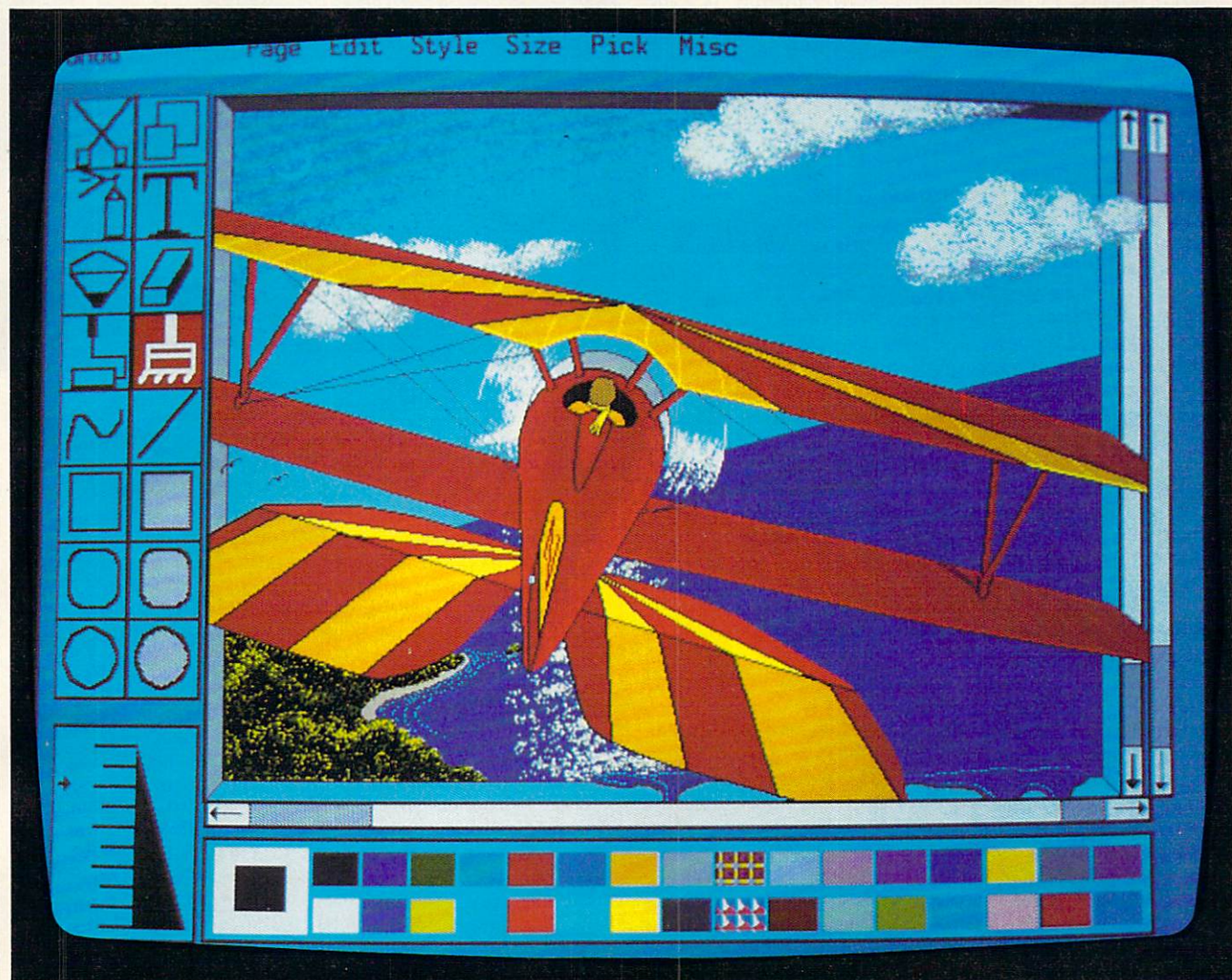
Info Franchise News, 728 Center Street, Lewiston, NY 14092. Trade publication. \$96. Also publishes *Handbook of Franchises Directory*. \$28.

Paul Stewart Associates, P.O. Box 25566, Dallas, TX 75225. Franchise counseling and evaluation services.

What You Need to Know When You Buy a Franchise, International Franchise Association, 1350 New York Ave. N.W., Suite 900, Washington, DC 20005. Lists 2,000 current members. \$4.95.

BUYER'S GUIDE TO POPULAR MONITORS AND DISPLAY CARDS

BY STEVEN CHEN AND BERNADETTE GREY



This image was created with Z-Soft's *PC Paintbrush +*, using 16 colors and a resolution of 640 by 480 (VGA).

MAKE THE MOVE TO GRAPHICS AND COLOR ON YOUR IBM PC, PS/2, OR COMPATIBLE

Until recently, few PC owners cared much about color graphics. Pretty computer screens were the domain of such machines as the Commodore Amiga and the Atari ST. However, changing attitudes toward color and graphics in the IBM world are giving many a computer screen much more appeal. Now that there are display cards that give IBM PCs, PS/2s, and compatibles the capability to display high-resolution graphics and up to 256 colors on the screen at any given

STEVEN CHEN is FAMILY & HOME-OFFICE COMPUTING's *managing technical editor*. BERNADETTE GREY is a *senior editor*.

time, an increasing number of computer buyers are re-evaluating their visual needs and desires.

For the first time, according to market surveys, the majority of IBM and compatibles owners use color monitors instead of monochrome monitors. And with their systems gussied up with high-resolution display cards and monitors, many users are seeking software to give their screens face-lifts. Indeed, from now on, you'll see more and more software for IBM PCs, PS/2s, and compatibles that will *require* color graphics boards and color monitors.

If you own or plan to buy any programs that use graphics—spreadsheets and entertainment software, for instance—you'll need, at the very least, a monochrome graphics card. A color display card and color monitor are even better. Unfortunately, first you'll need to learn the differences among the monitors on the market and among VGA, EGA, and the rest of those acronyms that are easier to ignore than understand. Then, to further complicate matters, you have to figure out how to find a card and monitor that work together.

What follows, in question-and-answer format, is a layperson's guide to graphics and color, plus four charts filled with information on the most popular monochrome and color monitors and graphics display cards available today. If you don't understand some of the terms mentioned in the chart or in the "Q & A," refer to the glossary on page 54.

Q. What are computer graphics and color?

A. Graphics are anything on a computer screen besides text, numbers, and symbols. Everything from circles to bar charts, to freehand drawings, to elaborate on-screen dungeons and castles are graphics. About six years ago, Hercules Computer Technology introduced a graphics card (also called a board or adapter) capable of displaying graphics on a monochrome monitor. For the first time, IBM owners could have graphics—without purchasing expensive color monitors and color graphics adapters (CGA).

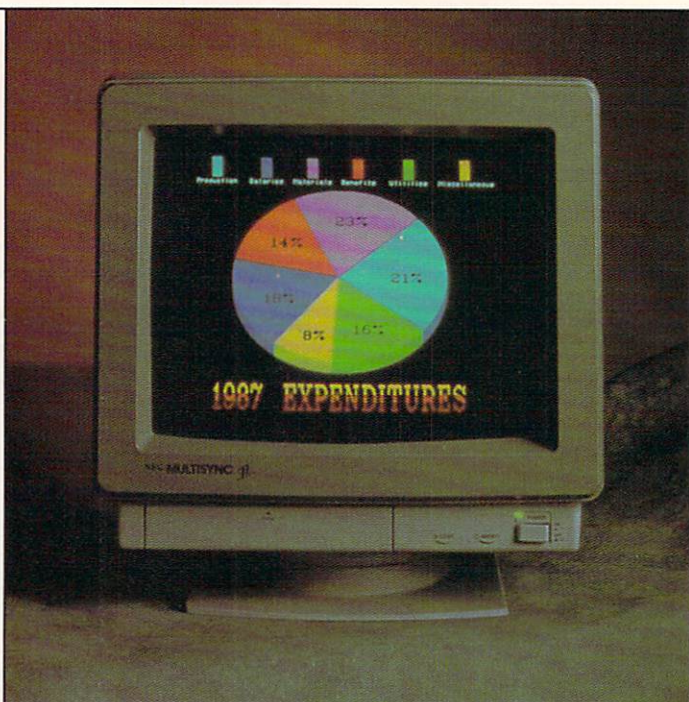
Color indicates more than two colors, thus not monochrome. (Monochrome monitors usually use green and black, amber and black, or white and black.) Some graphics boards can display up to four colors simultaneously; others flaunt up to 256 colors on the screen at any given time.

Q. What are the primary graphics standards, and what are the differences among them?

A. Here are the different standards that have emerged in the world of IBM graphics.

Color Graphics Adapter (CGA): Introduced by IBM in August 1981, CGA can display a maximum of four colors (from a palette of 16 colors) simultaneously at a resolution of 320 by 200. By today's standards, a resolution of 320 by 200 isn't very sharp, but it was the only color graphics standard in 1981.

Hercules Graphics Card (HGC): Introduced by Hercules in August 1982, HGC became the de facto standard for monochrome graphics. HGC offers a much crisper graphics resolution (720 by 348) than CGA does—but no color.



The NEC MultiSync II (\$899) is better designed than its predecessor, the NEC MultiSync.

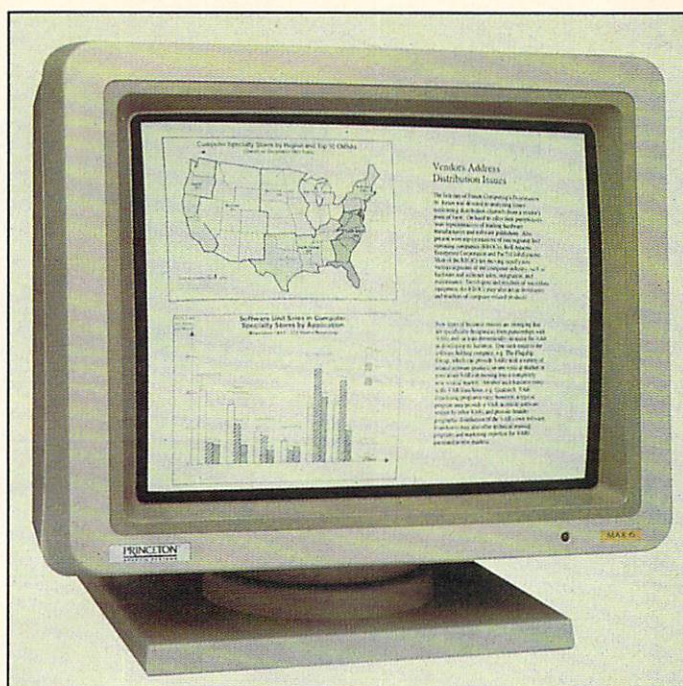
Enhanced Graphics Adapter (EGA): IBM made a quantum jump in graphics standards in 1984 when it introduced EGA, offering a resolution of 640 by 350 in 16 colors (from a palette of 64 colors). A number of other companies followed IBM's announcement with their own versions of EGA (dubbed enhanced EGA), offering even higher resolutions (640 by 480) and often including parallel ports for printers and supporting HGC. EGA is backward compatible, meaning that monitors and software designed for the CGA standard will also work with an EGA display card, but, of course, you will get only CGA-quality four-color graphics. Unfortunately, some software designed for CGA doesn't utilize EGA's higher resolution. Also, EGA cards won't work in a few of the older IBM PC compatibles.

Video Graphics Array (VGA): Introduced in April 1987 for IBM's PS/2 line (except for the Models 25 and 30), VGA offers a slightly higher resolution than can be achieved with EGA and an improved text display. This new graphics standard can also display many more colors at once—16 colors with a 640-by-480 resolution or 256 colors (!) at 320-by-200 pixels; its two-color text mode is 720-by-400 pixels. (When you add colors, you

WHICH TYPE OF DISPLAY CARD DO I NEED?

The following chart summarizes the potential and recommended applications for the various display cards currently on the market. A ● means that the display card is recommended for that particular application, while a △ designation means that the application is acceptable. A ○ designation indicates that the application is either not possible or not acceptable with the display card.

Display Card	Graphics Resolution	Maximum number of Colors that can be Displayed simultaneously	Palette	WORD PROCESSING/TEXT ONLY	WORD PROCESSING/TEXT AND GRAPHICS	DATABASES	SPREADSHEETS/TEXT ONLY	SPREADSHEETS/TEXT AND GRAPHICS	COMMUNICATIONS/TEXT ONLY	COMMUNICATIONS/TEXT AND GRAPHICS	DRAWING AND PAINTING	CHARTS AND PRESENTATIONS	DESKTOP PUBLISHING	EDUCATION	GAMES
MDA	None	2 (Monochrome)	N/A	●	○	○	○	○	○	○	○	○	○	○	○
HGC	720x348	2 (Monochrome)	N/A	●	●	●	●	●	●	△	●	●	●	△	△
CGA	320x200	4	16	○	○	○	○	○	○	○	△	△	○	●	●
	640x200	2 (Monochrome)	N/A	△	△	△	△	△	●	●	△	△	○	△	△
EGA	640x350	16	64	●	●	●	●	●	●	●	●	●	●	●	●
VGA	320x200	256	262,144	○	○	○	○	○	○	○	●	△	○	●	●
	640x480	16	262,144	●	●	●	●	●	●	●	●	●	●	●	●



The Princeton Graphics MAX-15 (\$389) is a 14-inch multiscan monochrome monitor.

sacrifice resolution.) VGA also offers an amazingly large palette of more than 262,000 colors.

Multi Color Graphics Adapter (MCGA): A standard created specifically for the Models 25 and 30, MCGA offers the same palette of colors as VGA does, but at a lower resolution and without EGA compatibility. (Only two colors can be displayed at the same time in 640-by-480 mode.)

Using a monochrome monitor, MCGA gives the Models 25 and 30 Mac-like shades of gray.

Board makers are now selling VGA cards that offer still higher resolutions than IBM's standard. For example, the Quadram VGA and Paradise VGA Plus offer a resolution of 800 by 600 in 16 colors. These cards are particularly useful for desktop publishing and computer-aided design and manufacturing (CAD/CAM) applications.

Q. Why do different graphics standards require different monitors?

A. Monitors designed for one graphics standard are not capable of understanding the information put out by the display card of another. A CGA monitor, for instance, does not support EGA's higher resolution or range of colors. Because of EGA's backward compatibility, however, you can use an EGA monitor with a CGA card—but your monitor's capacity for EGA-quality color and graphics will be wasted.

Q. Isn't VGA the best choice?

A. Not always. If you want or need 256 colors on-screen at one time (most people don't), you should probably buy VGA. Otherwise, in the foreseeable future, EGA will be just fine for most applications. And if you care about graphics, but not color, HGC and a good monochrome monitor are sufficient, as long as you stay away from software that requires color graphics.

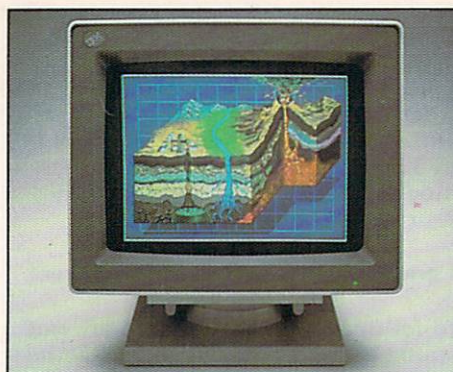
Q. What is a multisync monitor? What are its advantages and its disadvantages?

A. A multisync monitor (also called multiscan, multi-frequency, multimode, or ultrasync) lets you utilize the range of graphics adapters. The NEC MultiSync monitor, introduced by NEC Home Electronics in 1986, was the

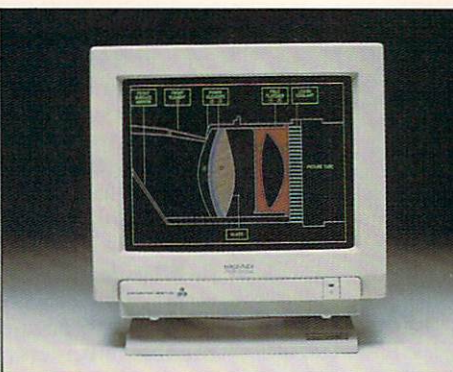
MONOCHROME MONITORS

Company	Model	List Price	Viewable Screen Size (diagonal, in inches)	Phosphor Types	Video Inputs		Display Card Supports:					Tilt/Swivel Base Included	Limited Warranty (Years)
					Digital	Analog	MDA/HGC	CGA	EGA	MCGA	VGA		
AST Research, Inc.	AST Premium Display/Monochrome	\$195	14	w	●	○	●	○	○	○	○	○	1
Amdek Corp.	Amdek Monitor/310A	\$199	12	a	●	○	●	○	○	○	○	○	2
	Amdek Monitor/410	\$240	12	a, g, w	●	○	●	○	○	○	○	○	\$29
	Amdek Monitor/432	\$245	14	a	○	●	○	○	○	●	●	○	1
Blue Chip Electronics, Inc.	12" TTL High Resolution Amber Monitor	\$130	12	a	●	○	●	○	○	○	○	○	1
	14" TTL Paper White Monitor	\$199	14	w	●	○	●	○	○	○	○	○	1
IBM Corp.	Monochrome Display Model 8503	\$250	12	w (gs)	○	●	○	○	○	●	●	○	1
Magnavox	7BM613 PC Monitor 80	\$189	12	g	●	○	●	○	○	○	○	\$30	2
	7BM623 PC Monitor 80	\$199	12	a	●	○	●	○	○	○	○	\$30	2
	7BM749 VGA Monochrome	\$249	14	w	○	●	○	○	○	●	●	○	2
NEC Home Electronics (USA) Inc.	MultiSync GS	\$299	14	a, g, w	●	●	●	●	●	●	●	●	1
Princeton Graphics Systems	MAX-12	\$220	12	a	●	○	●	○	○	○	○	○	1
	MAX-15	\$389	14	w	●	●	●	●	●	●	●	●	1
	PSM-03	\$250	12	w	○	●	○	○	○	●	●	○	1
Quimax Systems Inc.	DM-12	\$159	12	a	●	○	●	○	○	○	○	○	2
	DM-14+	\$199	14	a, g	○	○	○	○	○	○	○	○	2
	DM-3014	\$250	14	w	○	●	○	○	○	○	○	○	2
Samsung Electron Devices Co., Ltd.	MA2575	\$159	12	a	●	○	●	○	○	○	○	○	1
	ML4511	N/A	14	w	○	○	○	○	○	○	○	○	1
	ML4571	\$219	14	w	○	○	●	○	○	○	○	○	1
Tandy Corp.	VM-4 Monochrome Monitor	\$130	12	g	●	○	●	○	○	○	○	\$17	90 days
	VM-5 Monochrome Monitor	\$150	12	g	●	○	●	○	○	○	○	\$17	90 days
Tatung Company of America	MM-1255G	\$159	12	g	○	○	●	○	○	○	○	○	1
	MM-1295W	\$289	12	w	●	●	●	●	●	●	●	●	1
	MM-1422G	\$229	14	g	●	○	●	○	○	○	○	○	1
Taxan USA Corp.	Model 123	\$205	12	g	●	○	●	○	○	○	○	○	1
	Model 124	\$215	12	a	●	○	●	○	○	○	○	○	1
Thomson Information Systems	Thomson 230A	\$159	12	w	●	○	●	○	○	○	○	\$15	1
Wyse Technology	WY-530	\$235	14	a, g	●	○	●	○	○	○	○	○	1
Zenith Data Systems	ZMM-1470-G	\$299	14	g	●	○	○	○	○	○	○	○	1
	ZVM-1240	\$229	12	a	●	○	●	○	○	○	○	\$25	1

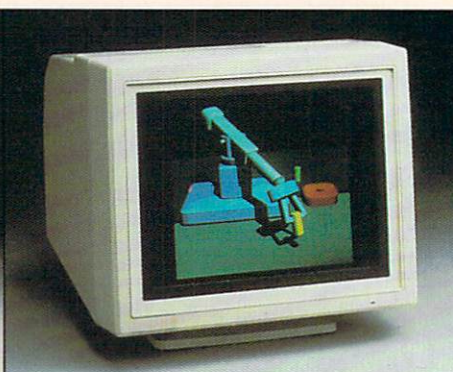
KEY: ● = yes; ○ = no; a = amber; g = green; gs = grayscale; w = white. * Not all multisync monitors support all display standards, and the results may vary with each monitor.



The IBM Color Display 8512 (\$595) was introduced for the PS/2 family.



The 9CM053 Enhanced Display (\$599) is a 13-inch EGA monitor from Magnavox.



The first monitor to have a perfectly flat screen is the Zenith ZCM-1490 (\$999).

COLOR MONITORS

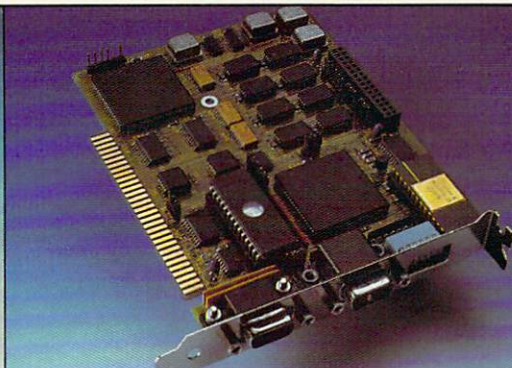
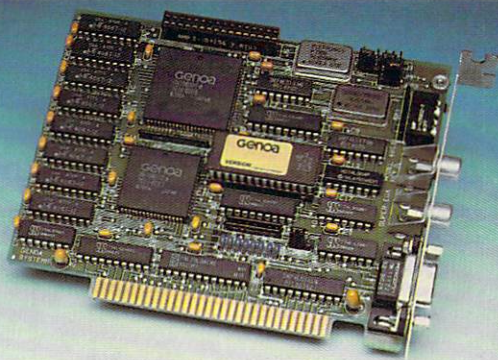
Company	Model	List Price	Viewable Screen Size (diagonal, in inches)	Dot Pitch (mm)	Video Inputs		Display Card Supports:					Multi-scan*	Text Switch	Tilt/Swivel Base Included	Limited Warranty (Years)
					Digital	Analog	MDA/HGC	CGA	EGA	MCGA	VGA				
AST Research	AST Premium Display/Enhanced Color	\$695	14	.31	●	○	○	●	●	○	○	○	○	●	1
Amdek Corp.	Amdek Monitor/600T	\$550	13	.43	●	○	○	●	○	○	○	○	●	●	1
	Amdek Monitor/722	\$750	13	.31	○	○	○	●	●	○	○	○	○	\$29	2
	Amdek Monitor/732	\$625	12	.28	○	●	○	○	○	●	○	○	○	○	1
Blue Chip Electronics, Inc.	14" Color Monitor	\$350	14	.43	●	○	○	●	○	○	○	○	○	○	1
IBM Corp.	Color Display 8512	\$595	14	.31	○	●	○	○	○	●	○	○	○	●	1
	Color Display 8513	\$685	12	.28	○	●	○	○	○	●	○	○	○	●	1
	Color Display 8514	\$1,550	16	.31	○	●	○	○	○	●	○	○	○	●	1
Logitech, Inc.	Logitech AutoSync	\$699	14	.31	●	○	○	●	○	○	○	○	○	○	1
Magnavox	8CM873 Multimode Display	\$899	13	.31	●	●	○	●	●	●	○	○	○	\$40	1
	9CM053 Enhanced Display	\$599	13	.39	○	○	○	○	○	○	○	○	○	\$30	2
	9CM082 VGA Display	\$649	13	.31	○	○	○	○	○	○	○	○	○	\$30	2
Mitsubishi Electronics	XC-1409C	\$519	13	.40	●	○	○	○	○	○	○	○	○	○	1
	XC-1410C	\$659	13	.40	○	○	○	○	○	○	○	○	○	\$30	1
	XC-1429C	\$685	13	.28	○	○	○	○	○	○	○	○	○	\$30	1
	XC-1430C	\$739	13	.31	○	○	○	○	○	○	○	○	○	\$30	1
	AUM-1371A Diamond Scan	\$889	13	.31	○	●	○	○	○	○	○	○	○	\$30	1
NEC Home Electronics (USA) Inc.	MultiSync II	\$899	14	.31	●	●	○	○	○	○	○	○	○	○	2
	MultiSync Plus	\$1,399	15	.31	○	○	○	○	○	○	○	○	○	○	2
	MultiSync XL	\$3,199	19	.31	○	○	○	○	○	○	○	○	○	○	2
Princeton Graphics Systems	HX-12+	\$695	12	.28	●	○	○	○	○	○	○	○	○	○	1
	HX-12E	\$750	12	.28	○	○	○	○	○	○	○	○	○	○	1
	PSC-28	\$695	12	.28	○	○	○	○	○	○	○	○	○	○	1
	UltraSync	\$849	12	.28	○	○	○	○	○	○	○	○	○	○	1
Quimax Systems Inc.	DM-2214	\$699	14	.31	○	○	○	○	○	○	○	○	○	○	2
	DM-3112	\$639	12	.28	○	○	○	○	○	○	○	○	○	○	2
	DM-3114	\$659	14	.31	○	○	○	○	○	○	○	○	○	○	2
Samsung Electron Devices Co., Ltd.	CQ4531	\$619	14	.31	○	○	○	○	○	○	○	○	○	○	1
	CW4644	\$419	14	.41	○	○	○	○	○	○	○	○	○	○	1
Sony Corp. of America	Multiscan CPD-1302	\$945	13	.26	●	●	○	○	○	○	○	○	○	\$40	3
	Multiscan CPD-1303	\$825	13	.37	○	○	○	○	○	○	○	○	○	\$40	3
Tandy Corp.	CM-11 RGBI Color Monitor	\$400	13	.42	●	○	○	○	○	○	○	○	○	\$17	90 days
	EGM-1 E. Graphics Monitor	\$700	14	.31	○	○	○	○	○	○	○	○	○	\$17	90 days
Tatung Company of America	CM-1460	\$529	14	.39	○	○	○	○	○	○	○	○	○	○	1
	CM-1480	\$699	14	.31	○	○	○	○	○	○	○	○	○	○	1
	CM-1495	\$875	14	.31	○	○	○	○	○	○	○	○	○	○	1
Taxan USA Corp.	Model 720	\$545	14	.43	○	○	○	○	○	○	○	○	○	○	1
	Model 765	\$695	14	.31	○	○	○	○	○	○	○	○	○	○	1
	Model 770+	\$795	14	.31	○	○	○	○	○	○	○	○	○	○	1
Thomson Information Systems Corp.	Thomson 4160	\$429	14	.38	○	○	○	○	○	○	○	○	○	\$15	1
	Thomson 4460	\$595	14	.38	○	○	○	○	○	○	○	○	○	○	1
	Thomson 4570	\$695	14	.31	○	○	○	○	○	○	○	○	○	○	1
Wyse Technology	WY-630	\$599	14	.43	○	○	○	○	○	○	○	○	○	○	1
	WY-640	\$749	14	.31	○	○	○	○	○	○	○	○	○	○	1
Zenith Data Systems	ZCM-1390	\$699	13	.31	○	○	○	○	○	○	○	○	○	○	1
	ZCM-1490	\$999	14	.28	○	○	○	○	○	○	○	○	○	○	1
	ZVM-1330	\$649	13	.43	○	○	○	○	○	○	○	○	○	○	1
	ZVM-1380	\$799	13	.31	○	○	○	○	○	○	○	○	○	○	1

KEY: ● = yes; ○ = no. * Not all multiscan monitors support all display standards, and the results may vary with each monitor.

MANUFACTURERS

AMDEK, (408) 436-8570; AST RESEARCH, (714) 863-9991; ATRONICS INTERNATIONAL, (408) 942-3344; BLUE CHIP ELECTRONICS, (602) 961-1485; BOCA RESEARCH, (305) 997-6227; EVEREX, (415) 498-1111; GENOA, (408) 432-9090; HERCULES, (415) 540-6000; IBM, (800) 447-4700; LOGITECH, (415) 792-8901; MAGNAVOX, (615) 521-4366; MITSUBISHI, (213) 515-3993; NEC, (800) 447-4700; ORCHID TECHNOLOGY, (415) 683-0300; PARADISE, (415) 468-6692; PRINCETON

GRAPHICS, (609) 683-1660; QUADRAM, (404) 923-6666; QUIMAX SYSTEMS, (408) 773-8282; SAMSUNG, (201) 587-9600; SONY, (201) 930-7071; SIGMA DESIGNS, (415) 770-0100; STB SYSTEMS, (214) 234-8750; TANDY, (817) 390-3011; TATUNG, (213) 979-7055; TAXAN USA, (408) 946-3400; TECMAR, (216) 349-1009; THOMSON, (213) 568-1002; VIDEO SEVEN, (415) 656-7800; WYSE, (408) 433-1000; ZENITH, (312) 699-4800.



Genoa Systems Corp.'s SuperEGA (\$299) display card supports MDA, HGC, CGA, and EGA.

The Vega VGA display card (\$499), from Video Seven Inc., was one of the first VGA cards to hit the market.

DISPLAY CARDS

Company	Model	List Price	Type	Video Outputs ¹				Supports ²										Limited Warranty (Years)	Additional Hardware/Ports
				Digital	Ana-log	MDA	HGC	CGA	EGA	MCGA	VGA	132-col.	640x480 ³	752x410	800x600	960x720	1024x768		
Amdek Corp.	Amdek Adapter/100	\$130	CGA	●	○	○	○	●	○	○	○	○	○	○	○	○	○	1	Composite Parallel
	Amdek Adapter/110	\$130	HGC	●	○	●	●	○	○	○	○	○	○	○	○	○	○	1	
	Amdek Adapter/120	\$250	CGA-HGC	●	○	●	●	○	○	○	○	○	○	○	○	○	○	1	
AST Research	AST-3G Plus II	\$395	eEGA	●	○	●	●	●	○	○	○	○	○	○	○	○	○	2	
	AST-VGA	\$445	VGA	○	●	●	●	●	○	●	●	○	○	○	○	○	○	2	
ATronics International, Inc.	Mega Graph	\$349	EGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Mega Graph Plus	\$399	eEGA	●	○	●	●	●	○	○	○	○	○	○	○	○	○	1	
Boca Research	Mono-Master/Plus	\$199	HGC	●	○	●	●	○	○	○	○	○	○	○	○	○	○	2	Parallel Serial
	Multi-EGA 350	\$199	eEGA	●	○	●	●	●	○	○	○	○	○	○	○	○	○	2	
	Multi-EGA 480	\$299	eEGA	●	○	●	●	●	○	○	○	○	○	○	○	○	○	2	
Everex Systems Inc.	EVGA	\$399	VGA	●	●	●	●	○	○	○	○	○	○	○	○	○	○	1	Parallel
	Evergraphics Deluxe	\$159	HGC	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Micro Enhancer	\$169	EGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Micro Enhancer Deluxe	\$189	eEGA	●	○	●	●	●	○	○	○	○	○	○	○	○	○	1	
Genoa Systems Corp.	Spectrum Half Card	\$199	CGA	●	○	●	○	○	○	○	○	○	○	○	○	○	○	1	Parallel
	SuperEGA	\$299	eEGA	●	○	●	●	○	○	○	○	○	○	○	○	○	○	1	
	SuperEGA HiRes +	\$429	eEGA	●	○	●	●	○	○	○	○	○	○	○	○	○	○	1	
	SuperVGA	\$445	VGA	●	○	●	●	○	○	○	○	○	○	○	○	○	○	1	
	SuperVGA HiRes	\$645	VGA	●	○	●	●	○	○	○	○	○	○	○	○	○	○	1	
Hercules Computer Technology	Hercules Graphics Card Plus	\$299	HGC	●	○	●	○	○	○	○	○	○	○	○	○	○	○	2	Parallel Parallel Parallel
	Hercules Color Card	\$245	CGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
	Hercules InColor Card	\$349	HGC	●	○	●	○	○	○	○	○	○	○	○	○	○	○	2	
IBM Corp.	Display Adapter	\$595	VGA	○	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
Logitech, Inc.	Logitech EGA Board	\$399	EGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	Mouse
Orchid Technology	Designer VGA	\$445	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	4	
Paradise Systems, Inc.	Basic Video Card	\$149	CGA-HGC	●	○	●	○	○	○	○	○	○	○	○	○	○	○	1	Parallel
	Basic EGA Card	\$199	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	AutoSwitch EGA-350 Card	\$299	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	AutoSwitch EGA-480 Card	\$349	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Paradise VGA Plus Card	\$399	VGA	○	○	○	○	○	○	○	○	○	○	○	○	○	○	3	
	Paradise VGA Professional Card	\$599	VGA	○	○	○	○	○	○	○	○	○	○	○	○	○	○	3	
Quadram	QuadEGA +	\$295	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	QuadEGA ProSync	\$395	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	QuadVGA	\$395	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
Sigma Designs, Inc.	SigmaEGA!	\$399	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Sigma VGA	\$399	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Sigma VGA/H	\$399	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Sigma VGA/X	\$579	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
STB Systems, Inc.	Color/Mono Video Adapter	\$149	CGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	Parallel
	Multi Res II	\$299	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
	STB AutoEGA	\$199	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
	VGA Extra	\$395	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
	VGA Extra/EM	\$595	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
Tatung Company America, Inc.	900 Omni Card	\$329	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	Composite Composite
	Platinum Card	\$449	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
Taxan USA Corp.	Model 535	\$115	HGC	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Model 560	\$229	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Model 557	\$295	EGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
	Model 570 Plus	\$299	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
Tecmar Inc.	EGA Master 480	\$495	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
	EGA Master 800	\$595	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
	VGA 812332	\$395	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
	VGA AD	\$495	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	2	
Thomson Information Systems Corp.	Enhanced Graphics Adapter	\$245	EGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	Mouse Mouse
	E. Graphics Adapter Ultra Ver.	\$395	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	
Video Seven Inc.	Vega	\$249	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	5	
	Vega Deluxe	\$379	eEGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	5	
	Vega VGA	\$499	VGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	5	
Wyse Technology	WY-445	\$499	EGA	●	○	○	○	○	○	○	○	○	○	○	○	○	○	1	

KEY: ● = yes; ○ = no; eEGA = EGA card also supports Hercules Graphics; ¹ Composite video is available on some display cards (see "Additional Hardware/Ports"); ² It may support additional graphics resolution; ³ For EGA only.

GRAPHICS TERMS AND PHRASES

Analog vs. Digital Monitors: Unlike digital monitors, analog monitors display different shades of colors and have vast color palettes. All VGA monitors are analog.

Bandwidth: The amount of data per second a monitor can accept from the computer. Measured in megahertz (MHz). Generally, the higher the bandwidth, the better the resolution. VGA monitors have a bandwidth of 30MHz, and CGA monitors have a bandwidth of 15MHz.

Dot Pitch: The distance between any two horizontally adjacent dots (pixels) on a screen. The smaller the number, the sharper the screen image. Measured in millimeters (mm).

Monochrome Display Adapter (MDA): The

first display card created for the IBM PC. MDA offers text—but no graphics. However, it's inexpensive (about \$150), and it even beats EGA for text clarity.

Multiscan or Multisync Monitor: A monitor that you can use with many different kinds of graphics cards.

132-Column Display: This feature, available on some display cards, lets you squeeze 132 columns—rather than the usual 80—of text onto each screen.

Palette: The total number of different colors that your computer system is capable of displaying. A PS/2 Model 50, for instance, has a palette of 262,144 colors, but it can display a maximum of 256 of those colors at one time.

Pixel: A pixel is a dot. All text and graphics that appear on a computer screen are made up of dots.

Resolution: The number of dots, horizontally and vertically, that a monitor can display. The higher the two numbers, the clearer the image.

RGB and RGBI: An abbreviation for red-green-blue. An RGB monitor is synonymous with a color monitor for an IBM or compatible computer. "I" stands for intensity. All EGA monitors are RGBI.

Text Switch: Usually located on the front of a color monitor, this switch temporarily turns a color monitor into a monochrome one for such applications as word processing.

first of these multifrequency monitors to hit the market. Although expensive (about \$900), multiscan monitors are very useful if you plan to change graphics boards or if your card offers a resolution that's higher than the standard. However, not all multiscan monitors support all graphics standards.

Q. Can I attach a monochrome monitor to a computer equipped with VGA or EGA?

A. Most of the time, yes. You need to set the DIP switches on the card to monochrome output mode (which usually emulates HGC). If you prefer monochrome output—but don't want to sacrifice the higher resolution of VGA or EGA—you should take a look at a multiscan monochrome monitor, such as the NEC Multisync GS or Princeton Graphics System's PGS MAX-15 (see accompanying chart).

Q. Is monitor size important?

A. Definitely. Most monitors have a viewable screen display of between 12 and 14 inches. (Your viewing area is about 30 percent greater with a 14-inch monitor than with a 12-inch monitor.) If you work with, let's say, large spreadsheets or with desktop-publishing applications, you want to see as much as possible on a single screen.

Q. Can I connect my computer to a color television instead of to a color monitor?

A. You would need a monitor/television, which is more expensive than a regular television and supports only CGA. You also can connect some display cards to TVs but the results are unacceptable for most applications.

Q. Doesn't color reduce the legibility of text?

A. In CGA mode, yes. On a monitor that supports only CGA, text looks dottier than it does on a monochrome monitor. With EGA and VGA, however, text quality is almost as crisp as it is on a good monochrome monitor.

Q. How much will a new monitor and display card cost?

A. A monochrome monitor costs about \$200, while the least expensive EGA and VGA monitors average about \$600 apiece; most multiscan monitors run about \$900. The price of graphics boards also varies widely. For instance, the Amdek Adapter/100, a CGA card, costs \$130, while a feature-packed VGA board sells for \$600. These prices and those listed in the chart are manufacturer's suggested retail. (Store prices often run 30 percent less.)

Q. I've decided on the color graphics standard I want. What features should I consider when buying a display card?

A. Once you've decided to go with, let's say, an EGA color system, choosing a graphics display card is quite simple. In general, more expensive cards usually have more features. When shopping around, you might want to find out whether or not the card supports the Hercules graphics standard, includes a parallel and/or serial port, and has a mouse port. Also, ask about the warranty; all of the display cards listed in the chart offer one- to five-year warranties.

Q. I've decided which type of color monitor I want. Now what?

A. First and foremost, consider dot pitch (the distance between adjacent dots on the screen). Generally, the lower the dot pitch, the clearer the image, thus, the more expensive the monitor. If you're buying an EGA or VGA monitor, the dot pitch should be .31 millimeters (mm) or lower. A CGA monitor should offer a dot pitch of .41mm or better.

Here are other questions you might ask: 1) Is the viewable screen size at least 12 inches? 2) Is there a tilt-swivel base? 3) Is there a text switch that will allow you to display text in monochrome (green, amber, or white)?

Then, narrowing down the choices will be mostly a matter of your preferences. How much money are you willing to spend on a monitor? How sharp and clear do the colors appear to you? Do you like the way the monitor looks?

Q. What's new and noteworthy in the world of color and graphics?

A. Flat Mask Technology: Zenith is now selling a flat tension mask CRT, a 14-inch VGA monitor with a very fine dot pitch of .28 mm. The \$999 ZCM-1490 monitor displays extremely clear and rich colors because room lights don't reflect off the screen. This is the first monitor that is truly flat; there is no curvature.

Full-Page Monitor: Some companies are manufacturing monitors that can display an 8.5-by-11-inch page of text. These monitors are being used primarily for desktop publishing.

New Graphics Chips: Intel and Texas Instruments have developed more powerful graphic chips that greatly improve the speed at which computers can display graphics. Most of the new desktop-publishing monitor-display-card systems use these new chips. ■



MAIL-ORDER BUYING GUIDE

USE THESE TIPS TO BECOME A SMARTER SHOPPER
AND MINIMIZE RISKS

BY BERNADETTE GREY

Every so often, FAMILY & HOME-OFFICE COMPUTING receives a letter or telephone call from a distressed reader complaining about a mail-order experience. We've heard tales of bogus promises, vanishing packages, bankrupt mail-order firms, damaged merchandise, and no-return policies, to name a few.

BERNADETTE GREY is a senior editor for FAMILY & HOME-OFFICE COMPUTING.

Yet, for many shoppers, mail order is the path to bargains, convenience, and selection. You often can save up to 30 percent on computers, peripherals, fax machines, copiers, software, and accessories.

This potpourri of tips, hints, and legal information should be all you need to shop confidently by mail, and, even better than that, to get exactly what you want.

DO YOUR HOMEWORK

If you go through certain preliminaries each time you order merchandise via mail order, you're bound to get the best deal possible from a reliable firm. Here are seven rules of thumb that you should follow before you make a purchase:

1. Know exactly what you want to purchase. If, for example, you're buying a Hayes-compatible modem, do

you want 1200, 2400, or 9600 baud? Internal or external? How much are you willing to spend?

2. Look through magazine and newspaper ads and catalogs for the best prices. Also check to see how much the merchandise costs at your local computer store.

3. Read advertisements carefully to figure out exactly what's being advertised. Don't rely on pictures. You may need a magnifying glass to read the fine print, and accompanying photos often imply that you're getting more than you really are.

4. Ask friends for advice. Where do they shop for computers and other home-office equipment? Have they

had any bad (or good) experiences from which you could learn?

5. Comparison shop via phone. There's nothing wrong with calling up, asking for a price and the salesperson's name, and saying "Thanks, good-bye."

6. Deal with reliable firms. In doubt? Check the Better Business Bureau, Consumer Protection Agency, or Direct Marketing Association. Contact the company about its warranty, exchange policy, missing facts, or questionable claims.

7. Protect yourself. Learn the laws protecting you from mail-order fraud. (See "Your Rights: How You Are Protected" on page 58.)

10 QUESTIONS TO ASK BEFORE ORDERING ANYTHING:

1. Can I pay with a major credit card?

Don't ever pay with cash, and try to avoid paying by check. If you charge items that are never delivered or arrive defective, you'll have 60 days from the date of shipping to stop payment through your credit-card company. If you must pay with a check, keep particularly close records of all conversations and check numbers.

2. What exactly am I getting?

What's included in the basic unit price? What else will I need? Be sure to ask, "Is this absolutely everything that I need?"

3. I don't understand what you mean. Can you explain?

Never be too embarrassed to ask questions. If you realize that you forgot to ask something after you hang up, call back.

4. Is your merchandise returnable?

Under what conditions? If it's not returnable, what's the company's exchange policy?

5. Is the product in stock?

If it's not in stock, it could take weeks longer to receive your merchandise.

6. Can I have the order number?

If there is such a number, jot it down—just in case your merchandise is missing later.

7. How will the merchandise be shipped?

If you need the items quickly, can the firm expedite shipment?

8. How long should it take for my order to arrive?

Record the date and time of your call and the people to whom you speak. If you haven't received your merchandise two days after it should have arrived, call the company and ask if there are any problems. It's the firm's responsibility to track down your merchandise.

9. How much?

Always ask for the total price. Mail order has hidden costs: shipping, credit-card fee, sales tax, and others. And don't assume that the printer is \$420 just because that's the price quoted in the ad. Prices change.

10. May I have your name, please?

Get the names of everyone to whom you speak.

THREE COMMON DISASTERS, AND HOW THEY COULD HAVE BEEN AVOIDED

DISASTER #1

Your equipment is broken or defective, or you need support. When you call the manufacturer, you find out that you've purchased gray-market merchandise (items sold through unauthorized dealers), and the company won't honor the warranty. The mail-order outlet you bought it from has no warranty agreements either.

HOW IT COULD HAVE BEEN AVOIDED:

Always ask about the warranty and support *before* you buy. An outrageously low price is a good indication that a product is gray market. To be sure, call the manufacturer and ask if that company is an authorized dealer. If you decide to purchase a gray-market product, make sure the dealer has its own warranty. (For more

information on the gray market, see our August 1987 issue.)

DISASTER #2

You order the wrong product. Someone at the company—but you can't remember whom—promised that you could get a refund. But now the company says, "Sorry, no refunds."

HOW IT COULD HAVE BEEN AVOIDED:

Get the first and last names of everyone with whom you speak. Salespeople are much more likely to be accurate and less likely to mislead you if they know that you've written down their names. Even better, get the company's written promise. If the company is reluctant to send a written agreement, think twice about doing business with it.

DISASTER #3

The United Parcel Service (UPS) has tried to deliver your package twice, but you haven't been home. You've checked the post office but your package isn't there. It's probably been returned to the warehouse, and another delivery will take at least a week.

HOW IT COULD HAVE BEEN AVOIDED:

Don't opt for a UPS delivery to your home unless someone is there during the day. If you work from your home—and are always there—then UPS is fine. Otherwise, have the package delivered to a building where there is a receptionist, security guard, or door attendant.

10 TROUBLE SIGNS (OR WHEN YOU SHOULD CONSIDER TAKING YOUR BUSINESS ELSEWHERE)

1. The price is too spectacular to believe.
2. The company doesn't accept credit cards.
3. The salesperson isn't computer savvy.
4. There's no technical support hotline.
5. You've heard about friends or friends of friends who've had problems with this particular company.
6. No one has ever heard of the company.
7. There's a no-return policy.
8. You just don't trust the company.
9. The product won't be delivered for four to six weeks. Three weeks is the longest you should wait.
10. You have trouble contacting the company because the telephone lines are always busy.



ADVICE FROM A MAIL-ORDER MAGNATE

PC Connection, Inc., a New Hampshire-based mail-order firm launched in 1982 that sells hardware and software for IBM PCs and compatibles, sold \$60 million worth of merchandise in 1986. With its 170 employees, PC Connection is a growing, successful, highly regarded mail-order firm for a number of reasons: Customers are happy with the company's prices, selection, and support, and they're pleased with the friendly and fair service provided. Here, David Hall, the chief executive officer of PC Connection, offers some advice to people who may have trepidations about mail-order shopping.

BEFORE YOU CALL . . .

"If you live in a large town or a city, attend a users' group meeting and ask people about their mail-order experiences. Whom do they call? Why? Have they had any bad experiences?"

"Also, talk to business associates. You're bound to find people who buy computer equipment via mail.

"To find reputable firms, look

through current and back issues of computer magazines. If you don't have a magazine library at home, go to the local library. In current issues, look for mail-order ads that interest you. Then, see if those same firms can be found in previous issues. The longer that a firm has been in business, the better.

"Watch out for bust-out scams: there have been a few instances of false advertisements appearing in magazines and newspapers. The ads offer merchandise at a price that you can't believe and say 'send check only and allow four to six weeks for delivery.' If you see such an ad, steer clear."

WHEN YOU CALL . . .

"Call the mail-order firm's toll-free number and see how they treat you. Ask them questions. If the salespeople are overly aggressive or aren't eager to answer your questions, forget them. They also shouldn't refer you to another number if you have questions.

"You should feel comfortable when you're talking to the salespeople. No one should belittle you just because you aren't computer-knowledgeable.

"To help you get the right product, tell the salesperson: 'I have a such-and-such computer, for example a Model 60 with 3.5-inch disk drives.' Make a note that you mentioned which machine you have.

"If you're buying software, know which version you want. Just asking for the current version isn't enough; the salesperson might not be up front with you. If you don't know which version is the latest one, look through some current computer magazine reviews or call three or four mail-order companies and ask them which is the latest version.

"Ask about the return policy. Ask 'What happens if I don't like a product when I get it?' If it's software, you're probably stuck with it because most software isn't copy protected. If it's hardware, you should be able to return it. Be aware that some companies charge a 10-20 percent restocking fee for returned goods."

WHEN YOU BUY . . .

"Ask how the company ships its merchandise and what that really means. How long will delivery take?"

"Make sure you ask how soon the company will ship your merchandise.

"Don't immediately send in the warranty card. Try out the product. When you know you want to keep the merchandise, then send in the warranty card.

"If you're buying from a particular company for the first time, do a trial order. Call up and order a software package for less than \$100. If you get your order quickly and without mishap, you can probably trust the firm with a larger order."

CHEN'S SEVEN LAWS OF MAIL-ORDER BUYING

Each year, FAMILY & HOME-OFFICE COMPUTING's managing technical editor, Steven C.M. Chen, buys via mail order thousands of dollars worth of equipment for the magazine's office and for his own home office. Over the years, he's learned how to be a smart mail-order shopper through trial and error. Here are some of the laws that he's learned the hard way.

1. Too-good-to-be-true prices are usually too good to be true.

If a product is being sold by one mail-order house for substantially less than it's being sold for by another, there must be a catch.

2. If you don't know exactly what you

ordered, you won't get what you want.

Have a list including the manufacturer's name, model number, hardware requirements, and other pertinent information before you call to order.

3. If you use a salesperson as your only resource, you may receive incorrect or biased information.

You can get product information and/or recommendations from magazines, friends, manufacturers, and mail-order catalogs.

4. The day after you throw away the boxes, you'll need them.

What will you pack up the equipment in if something breaks?

5. Whenever you assume that mail-order prices are always cheapest, you'll find an item you recently purchased via mail order at a store—for less money.

Your local computer store may offer a better deal, especially if you live in a large city, such as New York City, or if you wait for a sale.

6. If you're not certain that you're getting everything you need, you'll be

missing something when the order arrives.

For instance, if you're ordering a hard-disk drive, make sure you get the controller card, cables, external chassis, and power supply. If you're purchasing a modem, make sure it's Hayes compatible and find out if software is included and whether it's compatible with your system. If the modem is external, ask about the cables and the connector's gender.

7. If you don't keep records, you'll need them.

Pay by money order, check, charge, or credit card. Never send cash. Keep a copy of the ad, correspondence, company's name and address, and mailing costs. And record the date and time of your call. If you do have to return your purchase, make sure you call to get a return authorization number before sending anything back. Write down that number on the box and include the proper paperwork (receipt, invoice, and reason for return). Send copies, not originals.

sure it's not part of a merchandise series you or a family member ordered.

Damaged Items.

If damage is obvious, or if you decide not to accept the package, write REFUSED on the wrapper (at time of delivery) and return it unopened to the seller. No new postage is needed, unless the package came by insured, registered, certified, or C.O.D. mail, and you signed for it.

• If you open it first, enclose a note explaining the problem. Repackage it, add new postage, and mail it back by certified or insured mail.

Unsatisfactory Products.

Check the warranty or ask the seller about replacement, repair, or refund. If you think the advertising was misleading or you suspect fraud, contact the Postal Inspection Service.

Disputes.

If you pay by a charge or credit card not issued by the seller, the law says you can stop payment on the amount in dispute by notifying the company that issued the card. The company must then settle your problem within two billing cycles (but not more than 90 days).

The law says . . .

• If you win the dispute, the unpaid amount will be credited to your account.

• If your problem is not resolved to your satisfaction, you may not withhold payment unless you've made a sincere effort to work out the problem with the seller and provided:

1) the transaction is more than \$50, and

2) the seller is located within your state or within 100 miles of your home.

YOUR RIGHTS: HOW YOU ARE PROTECTED*

It helps to know your legal rights. The U.S. Postal Service and the Federal Trade Commission enforce laws covering purchases by mail.

Late Deliveries, Delays, Canceled Orders.

If a package is late, first check your local post office. They may be holding it for you.

• The FTC Mail Order Rule says mail-order companies must ship your order within the time promised, or, if no time is stated, within 30 days of receipt of your properly completed order and payment. If you pay by charge or credit card, the 30 days begin when you are charged.

• In case of delay, the seller must notify you when your order will be shipped. If the new shipment date is more than 30 days past the original date promised, you can accept the new date or cancel for a full refund.

Either way, you must do so in writing. (An easy, no-cost means for responding must be sent to you.) If the delay is less than 30 days, the process is the same, except that if you don't answer, it means you accept the delay.

• The seller must refund all your money within 7 working days after receiving your cancel order if merchandise cannot be shipped within 30 days or if you do not accept a delay offer. If your order was billed as a charge or credit, the seller has one billing cycle to notify the charge or credit-card issuer to credit your account.

• Exceptions to the Mail Order Rule include spaced deliveries such as magazine subscriptions (but not the first shipment), items which continue until you cancel (for example, books, records, and the like), C.O.D., photo finishing, seeds, or growing plants.

Unordered Merchandise.

If a product you didn't order comes by U.S. mail, it is illegal to pressure you to return it or to pay for it. But be

check, charge, or credit-card statement, and, if available, a copy of the original ad.

Mail Fraud—Misrepresentation:

Your local Postmaster or Postal Inspector or Chief Postal Inspector, U.S. Postal Service, Washington, DC 20260-2100; (202) 268-4267.

For Any Mail-Service Questions:

Your local Postmaster or the Consumer Advocate, U.S. Postal Service, 475 L'Enfant Plaza SW, Room 5821,

Washington, DC 20260-6720; (202) 268-2284.

Unordered Merchandise and Mail-Order Delay:

Consumer Inquiries, Federal Trade Commission, Washington, DC 20580; (202) 326-3238.

For Any Mail-Order Questions:

Your local Consumer Protection Agency or the Direct Marketing Association (DMA), 6 East 43rd St., New York, NY 10017; (212) 689-4977. ■

IF YOU NEED FURTHER HELP*

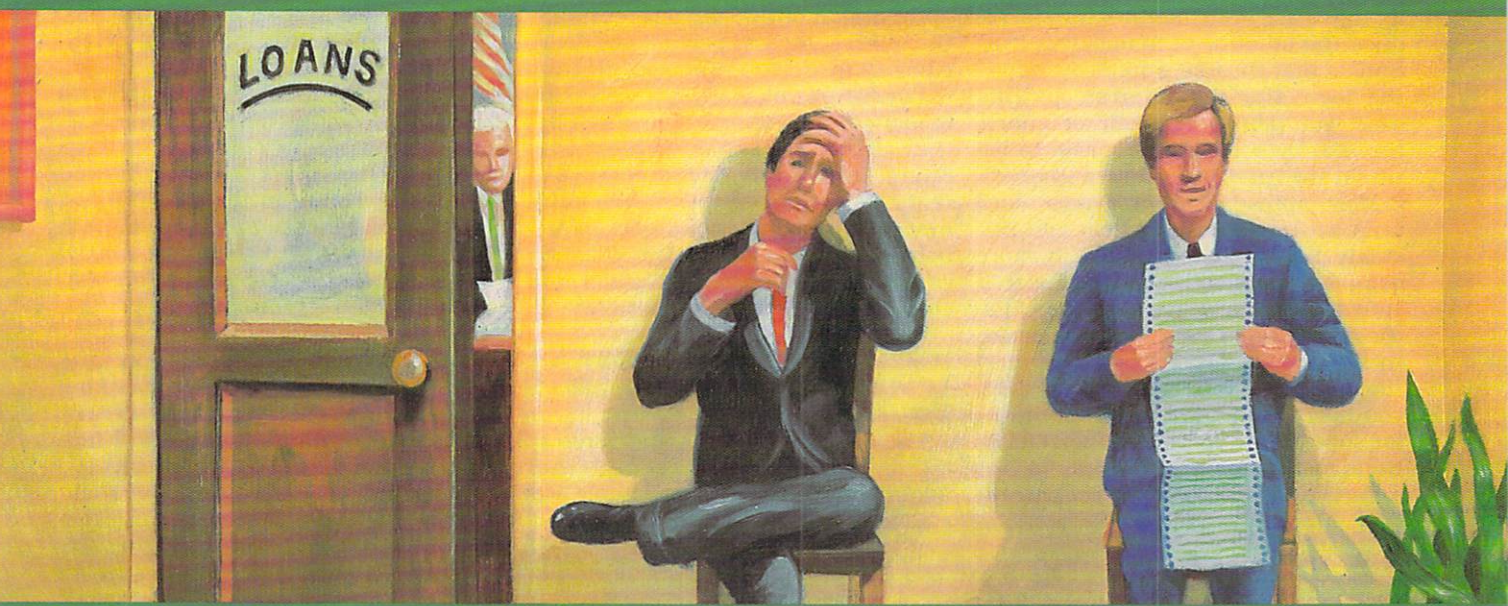
Most firms are reliable and depend upon repeat orders and goodwill to stay in business. If you don't get results within a reasonable time, contact the agencies listed below. Include details, a copy of your canceled

Company. Created in cooperation with the United States Postal Service, U.S. Office of Consumer Affairs,

and the Consumer Information Center of the General Services Administration.

* Published by the Consumer Card Information Service of the Consumer Affairs Office, American Express

Making Financial Decisions with a Spreadsheet



THE INS AND OUTS OF BORROWING AND LENDING

BY ROB KRUMM

On any list of top-selling business software, spreadsheets dominate. In the MS-DOS world, Lotus 1-2-3, the most widely recognized name, ranks number one, but *SuperCalc*, *Multiplan*, and *VP-Planner* are also popular. Microsoft's *Excel*, the leading spreadsheet for the Macintosh, now has a powerful MS-DOS version available as well. Don't be fooled by this popularity into thinking that everyone is using them for such complicated tasks as analysis and forecasting. Buying software and using it effectively are two separate things.

Even a modest spreadsheet pre-

sents most people with more mathematical power than they're used to exercising. The spreadsheet can calculate the value of a variety of formulas, and it often includes special functions for advanced mathematical calculations. But what good are those functions if you don't know where and when to use them? For most users, the battle is not to find a powerful program—that's easy—but to learn to put that power to practical use.

The purpose of this article is to look at some of the ways in which you can use the spreadsheet's inherent potential to provide you with insights into two of the most common busi-

ness and financial problems—borrowing and lending money.

THE VALUE OF MONEY INCREASES OVER TIME

One simple but powerful use of spreadsheets is to calculate the time-adjusted value of money. The concept of time-adjusted value is simple but compelling. Suppose a friend at work asked to borrow \$20. He promised to

ROB KRUMM—a computer teacher and writer in Walnut Creek, California—wrote the two-part "Timesaving Techniques for Word Processing" in the March and April 1988 issues of FAMILY & HOME-OFFICE COMPUTING.

pay you back next month. Sure enough, when the month had passed, he returned your \$20. Now you're even, right?

Not necessarily. Suppose that instead of lending the friend the money you placed it in a savings account for a month. At the end of that month you would have \$20 plus the interest; that value is called the "future" value of money. If your friend *really* wanted to repay the loan he would pay you not \$20 but the "future" value of \$20.

Another way to look at the same situation is to assume that your friend can come up with *only* \$20 to repay you at the end of next month. In that case, you might want to reduce the amount of money you lend him so that the \$20 would cover *both* the loan and the interest. In this case, you would discount or adjust the \$20 by some interest rate to arrive at the "present" value of that \$20.

Most spreadsheet programs have built-in functions that help you calculate time-adjusted values in more complex financial settings. Even if your spreadsheet does not include these functions, you can still make the same calculations by re-creating the formula. (Next month I'll show you how to build formula substitutes for some of the special financial functions mentioned here.)

Figure 1 presents an *Excel* spread-

sheet that calculates the present value of our hypothetical \$20 loan. In order to calculate a present value, you need to choose an interest rate by which the value can be discounted. To be realistic, let's use the average rate of a standard savings account, or 6 percent. The key to the worksheet is the PV() function—called @PV() in Lotus 1-2-3—which calculates the present value of some amount of cash that will be received in the future. In this case, the PV() function shows that the \$20 repayment is worth \$19.90 today. Keep in mind that interest rates are usually expressed as annual rates. Since we are compounding monthly in our example, the interest rate—6 percent—is divided by 12 to arrive at the monthly rate.

The future value and present value of money both express the reality that the value of cash changes over time. Financial analysis begins when you realize that for every action with money there are various options left behind. The wisdom of any action can only be determined when you compare it to the other possibilities.

WHEN IT'S BETTER TO GET A LOWER INTEREST RATE ON YOUR MONEY

The effect of time on the value of money can produce results that might surprise you. One example was

told to me by a computer consultant named Michael. An accountant wanted to purchase computer equipment from Michael costing \$4,500. The accountant felt that the additional equipment would increase her productivity during tax season. She mentioned that she was going to borrow the money to pay for the computer at 9.75-percent interest from a bank.

This gave Michael a bright idea. It seems that he was shopping for a certificate of deposit (CD). The best rate he had found was 7.25 percent for a 24-month period. He thought, why not finance the accountant's purchase himself at 9.75 percent instead of buying the certificate for only 7.25 percent?

Michael decided to build a spreadsheet that would help him analyze the alternatives. Column B of the worksheet in figure 2 shows the results of investing in the CD. The future value function is used in cell B10 to show how his money would accumulate at 7.25-percent interest compounded monthly over 24 months.

The total interest received would be \$699.91. The next step is to evaluate the gain if Michael financed the accountant's computer purchase himself through a loan. The first calculation needed will determine how much money Michael will receive from his accountant each month for 24 months. The calculation is a special form of a present value. Most current spreadsheets simplify this calculation by providing a payment function called PMT(), or @PMT(), which calculates a monthly payment when supplied with the amount of the loan, the interest rate, and the number of payments to be made. Column C of figure 2 uses the PMT() function in cell C8 to calculate a monthly payment of \$207.13.

Once the monthly payment is established, you can find the total gain—the total finance charge from the accountant's point of view—by multiplying the payments by 24 and subtracting \$4,500, the amount of the original loan. The results, \$471.20, appear in cell C11. Michael is in for a surprise. Despite the fact that he is charging the accountant a higher rate of interest than he would earn from the CD, that final figure is less than he would get from the CD.

The results make sense when you think about what is really going on when a loan is being repaid. Michael

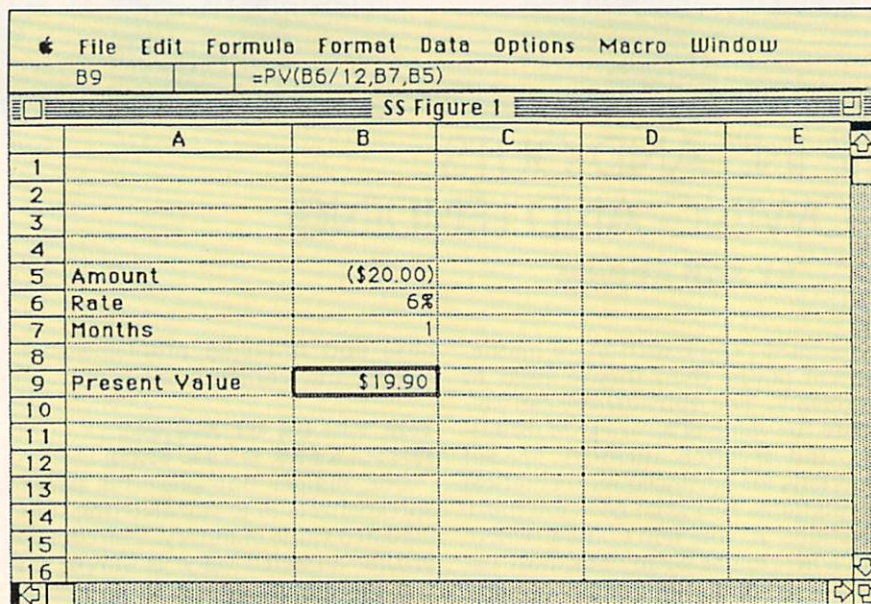


Figure 1: If you want to invest money today at 7-percent interest so that you get back \$50,000 in 15 years when your child is ready for college, how much would you need to invest? A spreadsheet helps you find an answer with its present value function—PV(). In the simplified example above, the PV() function uses the interest rate (cell B6), the number of periods (B7), and how much you want to get back (B5). The amount needed for the investment appears in the cell (B9) with the PV() function. Note that the structure of the PV() function appears right below the menu bar in *Excel*'s status line.

File Edit Formula Format Data Options Macro Window				
D10	=FV(D5/12,D6,-D4)			
SS Figure 2				
	A	B	C	D
1				
2				
3		CD	Loan	Reinvest Paymnt
4	Amount	\$4,500.00	\$4,500.00	\$207.13
5	Rate	7.25%	9.75%	6.00%
6	Months	24	24	24
7				
8	Monthly Payment	n/a	\$207.13	n/a
9				
10	Total received	\$5,199.91	\$4,971.20	\$5,267.81
11	Interest received	\$699.91	\$471.20	\$767.81
12				
13		CD - Loan		Reinvest - CD
14		\$228.71		\$67.90
15				
16				

Figure 2: By using Excel's future value function—FV()—column B shows how much money would be gained by depositing \$4,500 in a CD account at 7.25-percent interest for 24 months. Compare that to column C, which shows the same \$4,500 being loaned out at 9.75 percent. Because of compounding, the CD's lower interest rate actually yields more money than the loan does. However, the FV() function in cell D10 indicates that if the monthly payments on the same 9.75-percent loan are reinvested at 6 percent, the interest gained would be greater than that received by the CD. Which is the best investment of the three scenarios? It might be the CD, because it's a less risky investment than a personal loan.

will earn a full 9.75-percent interest on the \$4,500 loan for only one month. At the end of the first month, part of the payment made by the accountant (the part left over after the interest is paid) will go toward reducing the outstanding loan. The next month will calculate the interest on a value less than the original \$4,500. The process continues until all of the principal has been repaid. The amount of interest charged declines each month. This is not true of the CD. In fact, the opposite takes place. As the interest is added to the account each month, it then becomes part of the principal that earns interest the next month. The effect is referred to as *compounding*.

Michael decided to try a different scenario. He knew he could take the \$207.13 that his accountant would repay him each month and deposit it into a savings account to earn further interest. Column D in figure 2 shows what would happen to those monthly payments if reinvested at 6-

percent interest. Again, the future value function is used (this time in cell D10) to determine how much money he would gain. Then, Michael compared the total received through reinvesting the loan with the total from putting all \$4,500 into the CD (cell D14). At that point, he realized that even though he would make \$67.90 more from lending his accountant the money and reinvesting the payments than he would from the CD, the difference wasn't enough to offset the personal loan's greater risk.

Needless to say, Michael decided not to mention his bright idea to the accountant. He used the spreadsheet to clarify an erroneous notion that he had about different types of investments. In hindsight, the effect of compounding seems obvious, but it didn't appear that way at first. Michael made the mistake of focusing on one value, the rate of interest, as the key to analyzing the investment. The spreadsheet showed him aspects of investing he had ignored and saved

him from possibly losing money.

DECISION SUPPORT

We have looked at two ways of applying the mathematical capability provided by today's spreadsheet programs to the business of evaluating financial choices. Using a spreadsheet, you can quickly compile a clear, accurate, and understandable expression of a real-life problem. This type of decision support is invaluable in carrying out everyday business tasks.

Some spreadsheets have special features that are useful in particular areas. But almost all spreadsheet programs can carry out the operations discussed in this article in one form or another.

Next time we'll turn our attention to more ways of using spreadsheets to help you make financial decisions, and as I mentioned, I'll show you how to make formulas that substitute for such specialized financial functions as future value and present value. ■

PRODUCT REVIEWS

REVIEWS OF COMPUTERS, PERIPHERALS, AND OTHER HOME-OFFICE EQUIPMENT

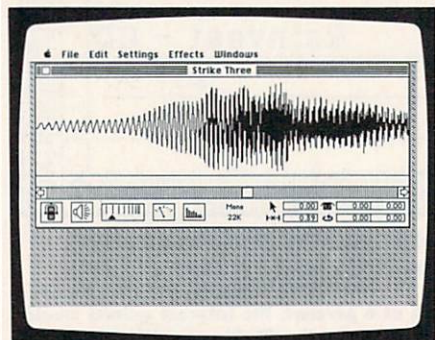
MacRecorder

MANUFACTURER: Farallon Computing, Inc.

ADDRESS: 2150 Kittredge St., Berkeley, CA 94704; (415) 849-2331

HARDWARE REQUIREMENTS: 512K Macintosh. 1MB, 2nd drive; hard-disk drive recommended.

PRICE: \$199



The *SoundEdit* software that comes with MacRecorder shows sounds as graphics patterns. Here's the word "strike" in an umpire's call "Strike three."

While a computer can be used to display presentation graphics, computer images without sound often feel as old-fashioned as a silent movie. All of that changes with the MacRecorder sound digitizer, a peripheral that lets you capture any sound—speech, music, and sound effects—to disk. Digitizers simulate sound by taking thousands of "sound snapshots" (a process called *sampling*) every second and letting your computer replay them.

The MacRecorder lets you sample sounds at four different rates, from 5.5 kilohertz (5,500 samples per second) to 22 KHz (22,000 samples per second). The latter rate—approximately half that at which music is sampled for compact discs (CDs)—allows for extremely clear sound.

The MacRecorder digitizer is a box that looks a bit like an oversized mouse. Installation is easy: simply

plug it into a serial port. On the box are a recording volume-level control, a built-in microphone, an external microphone jack, and a jack for attaching such sound sources as a stereo amplifier or a VCR.

Included are two programs to control the digitizer. You can use either the stand-alone software called *SoundEdit* or the *HyperCard* stack, *HyperSound*. *SoundEdit* is the more comprehensive of the two. Not only does it allow you to choose a sampling rate, check your volume level, record sounds, play them back, and save them into *HyperCard* stacks—as *HyperSound* does—it also gives you a wizard's toolbox for manipulating any recorded sound. The remarkable sound tools include adding echo, amplifying a sound, changing pitch, and making a sound fade in and out or play backward.

The other two elements included in the package are a patch cord for connecting MacRecorder to a stereo receiver and an especially useful manual.

I tested MacRecorder at all four sampling rates using the same sounds. At 22KHz, the digitized sounds were comparable to those you'd hear from a typical cassette player, while sounds recorded at 5.5KHz are okay for speech, only if absolute clarity is not needed. However, any of the four sounds would have improved clarity if played through an external speaker.

Why not always record at 22KHz, then? Because a sound exactly five seconds long (whether music, speech, or sound effect) takes up 112K on disk when sampled at 22KHz, 56K at 11KHz, 37K at 7.3KHz, and just 28K at 5.5KHz.

Surprisingly, MacRecorder is reasonably priced for anyone who uses a Mac to create on-screen presentations, instructional materials, stories, or games. And this sound digi-

tizer is even great for just plain fun. At less than \$200, it's a must-buy item for many Macintosh owners.

—DAVID HALLERMAN

CIRCLE READER SERVICE 100

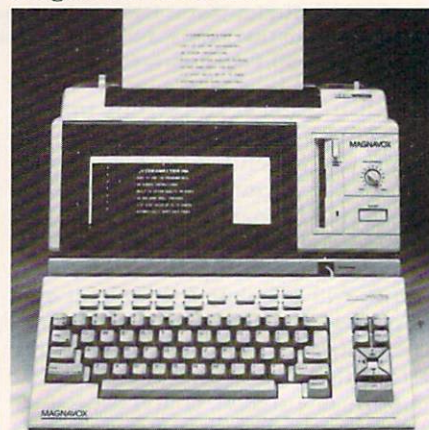
Magnavox Videowriter 450

MANUFACTURER: Magnavox, a division of Philips Consumer Electronics Company

ADDRESS: Interstate 40 and Straw Plains Pike, P.O. Box 14810, Knoxville, TN 37914; (615) 521-4316

PRICE: \$899

Those of us who have been dependent on word-processing software for years can't imagine life without a computer. Yet, I have many friends, some of them writers, who can't imagine life with one.



Dedicated word processors, such as the Videowriter 450, pictured here, are making their way into many home offices.

Put one of these computer adversaries in front of a dedicated word processor, however, and he or she is far less likely to be resistant. Many professionals who need the power and flexibility of word-processing software, but snub computers, are finding that dedicated word processors are suiting their needs.

Word processors, like the Magna-

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(For More Information Circle 177)

PRODUCT REVIEWS

vox Videowriter 450, are intended for people with one task in mind: writing. More straightforward and less intimidating than a computer, the Videowriter 450 is as easy to use as an electronic typewriter—there's no setup required, no complicated commands to memorize, and no operating system to wrestle.

Manufacturers of these single-application machines (with a keyboard, screen, software, and printer in one box) are enjoying increased sales. Magnavox, which introduced the first all-in-one word processor in 1985, predicts that sales of dedicated word processors this year will top 300,000—compared to 150,000 in 1987 and less than 60,000 in 1986.

Just about anyone will be able to pull a Videowriter 450 out of its box, plug it in, write and edit a manuscript, set margins, check spellings, rearrange paragraphs, and make a printout without ever opening the user's guide. No kidding. Instructions are built-in; keys are labeled with the words MOVE, COPY, FIND, LAYOUT, PRINT, BOLD, UNDERLINE, FONT, and more. Detailed on-screen prompts and help screens pop up at your beckoning. While it's unnecessary for most people, a well-organized and simple manual is included—just in case.

The Videowriter 450 can store up to 105 pages and 54 documents on one 3.5-inch disk and features a built-in thermal-transfer printer that prints on bond paper.

In numerous ways, it stands apart from other dedicated word processors I've used. One of its strongest assets is its sturdy detached keyboard, which has a nice touch and sensible command keys.

The word processor also has unique features that will appeal to home-office operators. Besides a 50,000-word thesaurus and 50,000-word spelling checker, the Videowriter 450 also has a mail-merge function that can accommodate up to 53 lists, each containing up to 76 cards. Mail merge, which replaces text in a previously prepared form letter with new information—such as name, address, city, state, and zip code—is useful for writing personalized business and form letters. In addition, it lets you position and print onto envelopes and labels. Because the Videowriter 450 has a parallel interface, you can make print-

outs using your own printer, instead of the one built into the Videowriter 450. The built-in printer can accommodate an optional sheet feeder, the Model PWP 102 (\$200), which holds 100 sheets of paper.

While print quality is exceptional, the built-in printer putts along at 25 characters per second in letter-quality mode. Faster draft speed moves at 50 characters per second (still slow).

The word processor has other flaws. The machine is awkward looking and, considering it's only one unit, it takes up a lot of space on an already crowded desk. The screen is small (5.5-by-10 inches) and, even with the tilt bar, too low for my eyes.

And for computer lovers, \$899 may seem like a lot to spend on a machine that doesn't do anything but word process. (You can find it in stores for about \$500.) But if you'll never use a computer for anything besides word processing or if you're a hopeless computer phobic, the Videowriter 450 is a suitable alternative.

—BERNADETTE GREY

CIRCLE READER SERVICE 101

Microsoft Mouse

MANUFACTURER: Microsoft Corp.
ADDRESS: Box 97017, Redmond, WA 98073; (206) 882-8080
HARDWARE REQUIREMENTS: IBM PC, PS/2, or compatible
PRICE: \$150–\$250

The new Microsoft Mouse, a handheld pointing device, isn't really even new; it's a redesigned mouse that's far superior to its predecessor in look, feel, and performance.

This mouse better addresses such human factors as comfort and ease-of-use. It's smaller, slicker, and proportionally shaped (it resembles a



This redesigned Microsoft Mouse, for IBM PCs, PS/2s, and compatibles, feels and performs better than its predecessor.

bar of soap), has a longer cable, and features two buttons for making selections. Also, the mouse's center of balance has been moved from the user's palm to the fingertips—where it belongs.

The package includes a user's guide, installation software, a control-panel program, some demonstration programs, and a choice of three software packages: *PC Paintbrush* (ZSoft), *Microsoft Windows*, or *EasyCAD* (Evolution Computing). (Those who own an IBM PS/2 or who don't have a slot available for the mouse circuit board will need the Serial-PS/2 package.) The installation program makes it easy to install and configure the mouse for your system. The control-panel program, when activated, lets you set the sensitivity of the mouse to suit your tastes. The demo programs and *EasyCAD* give you a chance to test your mouse right away.

I found that the Microsoft Mouse works great with *Norton Commander*, the DOS shell program I use for file manipulation with my hard-drive equipped PC compatible. Making choices is now as easy as moving the mouse until the cursor is above my choice and then clicking.

The Microsoft Mouse is a great addition to any IBM PC or compatible. It allows users to be more creative with some programs and makes other programs just plain easier to operate. It also gives mouse lovers another reason to investigate the world of PC compatibles.

—JOEY LATIMER

CIRCLE READER SERVICE 102

Star Micronics NB24-10 Printer

MANUFACTURER: Star Micronics, Inc.
ADDRESS: 200 Park Ave., Suite 3510, New York, NY 10166; (212) 986-6770
HARDWARE REQUIREMENTS: IBM PC or compatible
PRICE: \$749

Star Micronics has several entries in the field of 24-pin printers; the NB24-10, currently the company's biggest seller, is a narrow-carriage (10-inch) printer targeted at businesspeople who are interested in making the jump to low-cost, letter-quality printing with a well-built, reasonably priced machine.

The NB24-10's features place it firmly in the mainstream. It can print at 180 characters per second

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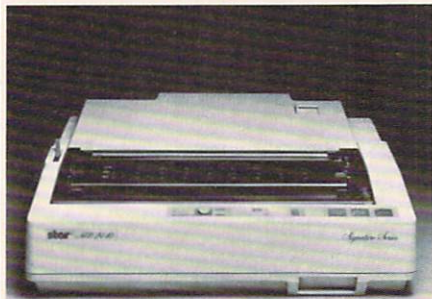
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PRODUCT REVIEWS

(cps) in pica draft mode or 60 cps in letter-quality mode. Prestige is the standard-issue letter-quality font, and an Italic Prestige is included. Font cartridges (\$60 each) are available for Courier and Italic, Orator, or Letter Gothic. Because it emulates the popular Epson LQ-800 and the IBM Graphics printer, it should work effortlessly with most commercial software packages.



The NB24-10 is a \$749 narrow-carriage 24-pin printer.

To most eyes, 24-pin printer output comes very close to a typewriter's. Not all printers are the same, however, and the discriminating buyer should examine hard-copy output before making a decision. The Star's letter-quality output is very good and should satisfy almost any reader.

The control panel is an exercise in economy. The manufacturer managed to fit a large amount of functionality into relatively few keys. Three typeface keys allow the user to select font, letter or draft quality, and pitch. In addition, three paper-handling keys set the top of form, paper feed, and on-off-line status. In addition, a small knob allows users to set the form length. Function keys available on the control panel allow you to set such parameters as left and right margins. Unfortunately, there's no information on the control panel to guide you, although a large, plastic-coated information card is included for quick reference.

Paper handling on the NB24-10 is straightforward and basic. The printer comes standard with a pin-feed capability but can also use single sheets. An optional cut-sheet feeder (\$99) allows automatic single-sheet feeding for word-processing or mail-merging operations. Perhaps the Star's major weakness for many

home-office applications is that switching back and forth between tractor and single sheets means users must completely remove the tractor feed and attach the single-sheet feeder. Several other printer manufacturers, such as Epson and Toshiba, now offer more sophisticated systems that eliminate this problem.

One of the NB24-10's best features is its well-organized, complete, and very readable manual. In addition to a chapter on how to use the Star with many major software packages, there are examples of how to use the printer's features with BASIC programming. Since mastering your printer can be a major problem, this is a big plus.

The NB24-10 comes standard with a parallel interface and a 4K buffer, expandable to 20K for \$149. An RS-232 serial interface is also available (\$129).

The NB24-10 is not going to be suitable for all 24-pin printer buyers; but it has some definite strong points and is a legitimate alternative for people who feel hemmed in by the lack of versatility in a daisy-wheel or 9-pin printer. —DAVID WILSON

CIRCLE READER SERVICE 103

Toshiba 3100/20 Portable Computer

MANUFACTURER: Toshiba's Information Systems Division
ADDRESS: 9740 Irvine Blvd., Irvine, CA 92718; (714) 583-3000
PRICE: \$4,699

Toshiba's 3100/20 is the ultimate hotel-room computer. With PC AT speed, a fast 20MB hard disk built-in, and an extraordinarily crisp and readable display, this is powerful weaponry for the business Road Warrior who wants the capabilities of an office system while traveling.

The 3100/20 is a portable rather than a laptop computer, and that's an important distinction. Even though 15 pounds isn't a great deal of weight for this much power, you're not likely to forget you're carrying it as you run to catch your plane. To make transportation easier, there is a built-in handle for local lugging and a handsome padded carrying case with a shoulder strap for the long haul.

The power supply is the other power-versus-convenience trade-off. The Toshiba 3100/20 must be con-

nected to an electrical outlet, so computing on airplanes or trains is usually out of the question.

When you do plug in the machine, though, you're in for a treat. The most visible benefit is the large gas-plasma screen (7.75-by-5.75 inches). While most portables use forms of liquid crystal displays (LCDs), which rely on reflected light, the gas-plasma screen lights up with a red-orange glow. The Toshiba conforms to the CGA standard, making it compatible with most MS-DOS software. It doesn't display color but uses bold and reversed type instead to indicate the distinctions among shades in the CGA palette. Thanks to the sharpness of the display and the clear distinction between character shapes in the normal and bold typefaces, this system works very well. The gas-plasma display is at least as readable as my regular desktop monitor; if you like, you can use the unit's RGB port in the back to attach a color monitor.

Another high-power feature of the Toshiba 3100/20 is the 20MB hard disk, which has an access speed of 76 milliseconds and a rugged construction. Even a hardware-hungry program like *Microsoft Excel* can go on the road with this machine. An AT-standard (9-pin) serial port and a parallel port are built-in for easy connection of a mouse and/or printer, as well as a port that allows you to attach an external 5.25-inch drive. You'll also find an internal expansion slot for adding a 1200-baud modem (\$399), a 2MB extended memory card (\$1,699), or an expansion chassis interface card (\$199) and expansion chassis (\$999).

The keyboard is the best I've ever used on a portable. The keys are well-shaped and have an appealing clickiness. The function keys are all lined up at the top, and although there is no separate numeric keypad, an add-on numeric keypad is available for \$99.

No review of a Toshiba portable is complete without mentioning the company's superb warranty coverage. If the computer breaks down, send it back to the company. Within 24 hours from the time it is received, Toshiba will ship you, via overnight delivery service, either your own repaired machine or a loaner to use until repairs are completed. That coverage lasts a year,



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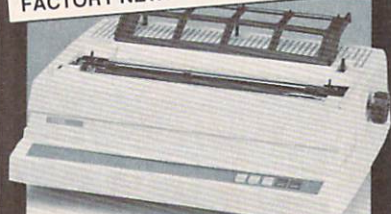
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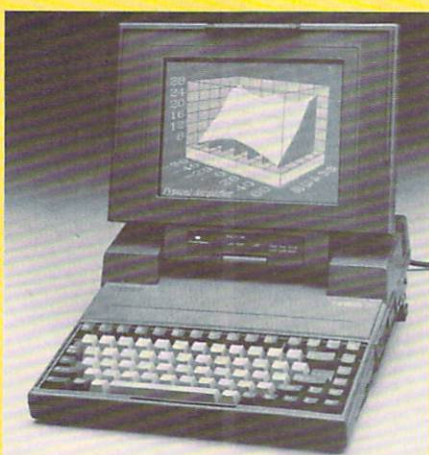
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PRODUCT REVIEWS



TOSHIBA 3100/20 SPECIFICATIONS

MICROPROCESSOR: Intel 80286 (4/8MHz)

MEMORY: 640K, expandable to 2.6MB

OPERATING SYSTEM: MS-DOS 3.2

WEIGHT: 15 pounds

DIMENSIONS: 12.2-by-3.1-by-14.2 inches

BUILT-IN PORTS: Five (serial, parallel, 5.25-inch external disk drive, RGB monitor port, and numeric keypad)

EXPANSION SLOTS: One; for optional modem, extended memory card, or expansion chassis (which has five slots)

DISK DRIVES: 3.5-inch and 20MB hard-disk drive

GRAPHICS DISPLAY: Gas plasma

SOFTWARE INCLUDED: Lotus Metro and MS-DOS 3.2

WARRANTY: One year

LIST PRICE: \$4,699

and you can pay to extend it further.

The big question for most of us who gaze longingly at this sleek, status-symbol computer is price. Even at the hugest discount, the Toshiba 3100/20 currently runs about \$3,000, and the internal modem that many portable users want costs hundreds more. You might consider using the computer at the office as well as on the road, but expandability is limited. An expansion chassis that accommodates five PC (not AT) add-on boards is available, but the chassis and interface card add \$1,200 to the price tag.

However, if you travel regularly and require heavy-duty computing power on the road, the Toshiba 3100/20 could prove to be a terrific investment. And if you use a portable for presentations, clients and co-workers are sure to be impressed when you pop the top and light up the gas-plasma display.

—STEVE MORGENSTERN

CIRCLE READER SERVICE 104

Upcoming Features in

FAMILY & HOME OFFICE COMPUTING

JULY

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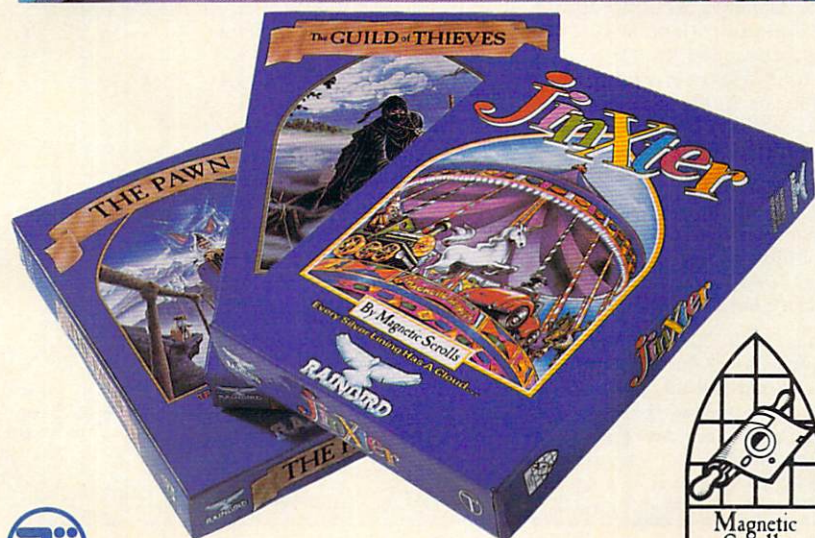
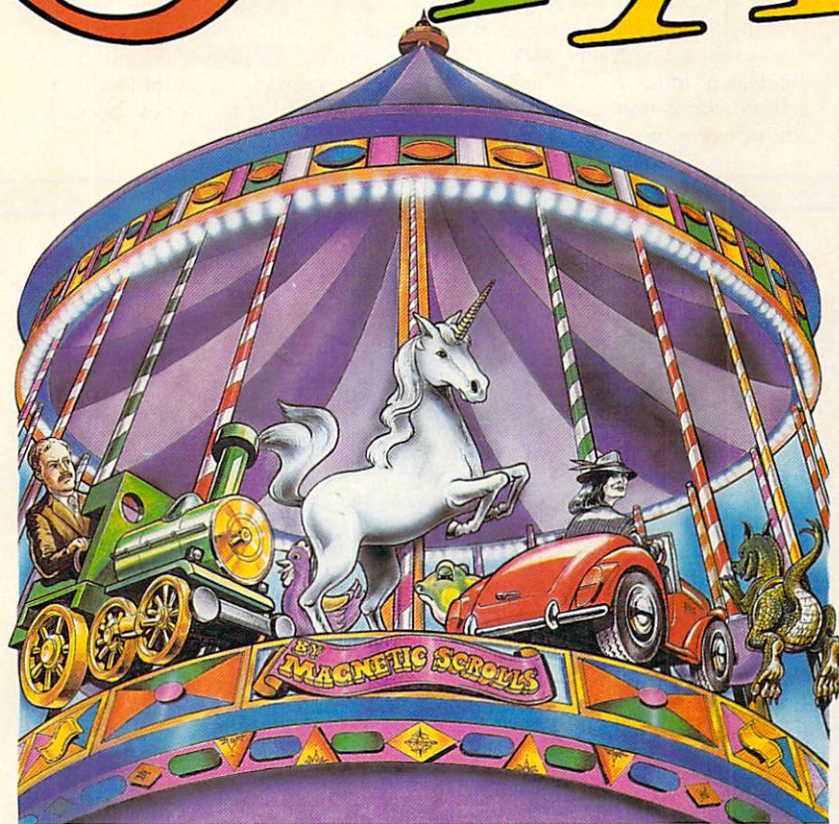
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Amiga® and C64® Commodore Business Machine Inc.

SOFTWARE GUIDE

Welcome to FAMILY & HOME-OFFICE COMPUTING's Software Guide. The following table relates to the review charts that follow. It lists the various types of computers as designated under "hardware required" (and other hardware designations in this issue) and the models included under each designation.

DESIGNATION	MODELS
Amiga	500, 1000, 2000
Apple	II, II Plus, IIe, IIc, IIGs (in IIe/c mode)
64K Apple	II Plus, IIe, IIc, IIGs (in IIe/c mode)
128K Apple	IIe, IIc, IIGs (in IIe/c mode)
Apple IIGs	IIGs only
Atari	800, 600XL, 65XE, 130XE
Atari ST	520ST, 1040ST, MegaST
C 64/128	C 64, C 128 (in 64 mode)
C 128	C 128 only
IBM PC	PC, XT, AT, PS/2, and compatibles
Macintosh	128K, 512K, Plus, SE, II
Tandy CoCo	2, 3

Please note: All Apple designations (except for IIGs) include compatibles such as the Laser 128 or Franklin 500. Titles listed for the IBM PC will also run on most IBM PC compatibles (as well as the IBM PS/2 series); check with the publisher of the program or your dealer for compatibility. Any additional hardware listed is required unless noted as "recommended" or "optional." In many cases, "2nd drive" refers to either a floppy-disk drive or hard-disk drive. KEY: ● = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. D = Documentation, or the instructions that accompany a program. EH = Error Handling, the software's capacity to accommodate errors made by the user. PS = Play System (in the Entertainment reviews), the quality of the game's design and its playability. GQ = Graphics Quality, evaluated in light of each model's graphics capabilities. EU = Ease of Use after the initial learning period; varies from computer to computer. V = Value for money, or how the software measures up to its price.

BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware required	CP	Ratings						
				O	D	EH	GQ	EU	V	
BETTER WORKING COMMUNICATOR Spinnaker Software One Kendall Square Cambridge, MA 02139 (617) 494-1200 \$30 ©1987	Inexperienced in going on-line? Then you might appreciate this communications program for such features as a progress window during XModem file transfers or for its menu and help screens. However, its dialing directory and macros are limited, and it won't work if you don't have a touch-tone phone. —CAMPBELL	256K IBM PC. Hayes-compatible modem only.	N	★ ★	★ ★	★ ★	N/A	E	★ ★	
DISKTOOLS PLUS Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$50 ©1987	Several highlights mark this fine update of the <i>BatteryPak</i> desk accessories, including DiskTools II for such tasks as deleting files and making new folders; Calendar with room for daily appointments; and Phone Pad for both notes and dialing. —HALLERMAN	512K Macintosh. Modem (for Phone Pad dialing function). Hard-disk drive recommended.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★	
FOCAL POINT Activision 2350 Bayshore Parkway Mountain View, CA 94043 (415) 960-0410 \$100 ©1987	A system of interconnected <i>HyperCard</i> stacks that helps you manage personal business information: time, projects, proposals, clients, vendors, expenses, and deadlines. You can customize it to your work world, making it more practical and useful. —ANDERSON	1MB Macintosh. 2nd drive (hard-disk drive recommended). <i>HyperCard</i> .	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
FREEWAY Kortek, Inc. 505 Hamilton Ave. Palo Alto, CA 94301 (415) 327-4555 \$60 ©1987	As an entry to the telecommunications field, <i>Freeway</i> deserves serious consideration by beginners for its well-organized menus with help for each item and for an autopilot mode that records each keystroke of a log-on for playback the next time you go on-line.† —CIRULLO	384K IBM PC. CGA, EGA, or Hercules.	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★	
GRAMMATIK II Reference Software 330 Townsend St., #131 San Francisco, CA 94107 (415) 541-0222 \$89 ©1986-1987	Uses an internal English language rule book to analyze your word-processed documents and suggests ways to "improve" them. Can be helpful if you know when to accept and when to reject <i>Grammatik's</i> criticism. Its many options add value.† —HUNT	128K IBM PC. 2nd drive optional.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★	
JAVELIN 1.1 Javelin Software Corp. One Kendall Square, #200 Cambridge, MA 02139 (617) 494-1400 \$100 ©1986-1987	Although it contains a full-blown spreadsheet, <i>Javelin</i> is not confined to this. The spreadsheet is just one of 10 "views" that model business and financial problems. You can also create flowcharts, tables, and other graphs and charts. A powerhouse.† —BEECHHOLD	512K IBM PC. 2nd drive. CGA, EGA, or Hercules.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★	

RATINGS KEY ● Overall performance; D Documentation; EH Error-Handling; GQ Graphics Quality; EU Ease of Use; V Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not Applicable; E Easy; A Average; D Difficult; CP Copy Protected, yes or no; † Longer review follows chart

BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware required	Ratings						
			CP	O	D	EH	GQ	EU	V
LIST PLUS Activision (see page 70 for address and phone) \$100 ©1987	A database that looks like a spreadsheet most of the time (rows, columns, and cells), with report functions—such as basic arithmetic and If-Then-Else branching—that give you good control over numeric data. Accepts AppleWorks database files, too. —ZORNBERG	768K Apple IIgs. 2nd drive optional.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★
PC-TYPE + ButtonWare, Inc. P.O. Box 5786 Bellevue, WA 98006 (206) 454-0479 \$70 ©1985-1987	A word processor like a race car—extremely powerful but lacking in comfort. Has many extras—such as mail merge, a spelling checker, and label making—but is awkward to use. Not for the timid, yet it's shareware, so you can try it out before you buy. —HUNT	256K IBM PC. 2nd drive recommended.	N	★ ★	★ ★	★ ★	★ ★	D	★ ★
PRECURSOR The Aldridge Company 2500 City West Blvd., #575 Houston, TX 77042 (713) 953-1940 \$70 ©1985-1987	If you have a basic grasp of MS-DOS, then you'll be able to set up this menu-making system for running programs. It's especially helpful if the computer is being used by several people, since you can protect data from such errors as accidentally reformatting the hard disk. —CAMPBELL	128K IBM PC. Hard-disk drive recommended.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★
SEARCH THE SCRIPTURES BibleSoft, Inc. 1300 Hudson Lane, #10 Monroe, LA 71201 (318) 343-0487 \$250 ©1987	With Genesis to Revelation on eight disks that also include a word processor with a good search function and a browse mode, I plowed easily through Bible studies. But the program would occasionally lock up when I searched for verses not on disk. —MORCOS	256K IBM PC. 512K recommended. 2nd drive. Hard-disk drive recommended.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★

EDUCATION & CREATIVITY

Title Publisher Price	Brief description	Hardware required	Ratings						
			CP	O	D	EH	GQ	EU	V
AMERICAN DISCOVERY Great Wave Software 5353 Scotts Valley Drive Scotts Valley, CA 95066 (408) 438-1990 \$70 ©1987	A geography game equally suited to students and trivia buffs. The basic game involves finding states on a United States map; but there's much more, such as identifying state borders, capitals, or flowers, and finding regional rivers or lakes. Value packed.† —ZORNBERG	512K Macintosh. Printer recommended.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★
DS TUTOR Design Software 1275 W. Roosevelt Road West Chicago, IL 60185 (312) 231-4540 \$40 ©1987	A book-like introduction to computers that lacks the high-quality diagrams and illustrations of a good computer book. Lacks editorial polish, too—typographical and grammatical errors abound, and computer jargon is often explained with further jargon. —SUMMERS	256K IBM PC. CGA optional.	N	★	★	★ ★ ★	N/A	E	★
FIRST LETTERS & WORDS First Byte 3333 East Spring St. Long Beach, CA 90806 (213) 595-7006 \$50 ©1987	If your kids are like mine, they enjoy software that reads to them—such as this talking program. Activities include matching upper- and lower-case letters and solving a short riddle. You can even personalize the messages given for correct answers. —SUMMERS	Reviewed on 512K Amiga. Also for 512K Atari ST, 768K Apple IIgs, 512K Macintosh. Color monitor (not Macintosh).	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
MACDRUMS Coda Music Software 1401 E. 79th St. Bloomington, MN 55425 (612) 854-1288 \$50 ©1987	Software-based drum synthesizer with digital samples (recordings) of 35 real percussion instruments. Made it easy to coax the Mac into playing almost any drum part I heard in my head. For working out songs or exploring rhythm patterns, it can't be beat. —LATIMER	512K Macintosh (not Macintosh II). 2nd drive, external speaker recommended. MIDI optional.	Y	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★
PRINT MAGIC Epyx, Inc. 600 Galveston Drive Redwood City, CA 94063 (415) 366-0606 \$60 ©1987	The latest print-design software gives you unusual control over your creations—signs, banners, and cards. Lets you use graphics from <i>The Print Shop</i> and <i>The Newsroom</i> . With Macintosh-like mouse control and menus, it's exceptionally easy to operate. —SOLOMON	Reviewed on 128K Apple. Also for 256K IBM PC. Mouse recommended.	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★

RATINGS KEY O Overall performance; D Documentation; EH Error-Handling; GQ Graphics Quality; EU Ease of Use; V Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not Applicable; E Easy; A Average; D Difficult; CP Copy Protected, yes or no; † Longer review follows chart

ENTERTAINMENT

Title Publisher Price	Brief description	Hardware required	CP	Ratings						
				O	D	PS	GQ	EU	V	
APOLLO 18 Accolade, Inc. 550 S. Winchester Blvd., #200 San Jose, CA 95128 (408) 296-8400 \$30 ©1987	Demanding but rewarding simulation of an Apollo moon shot. The arcade action lets you control takeoff, course corrections, lunar orbit docking, landing, and even space walking. Difficult to learn, this mission to the moon is best left to devoted arcade fans. —DELSON	C 64/128. Joystick recommended.	Y	★ ★	★ ★	★ ★	★ ★	D	★ ★	
BISMARCK Datasoft/IntelliCreations 19808 Nordhoff Place Chatsworth, CA 91311 (818) 886-5922 \$30 ©1987	During WWII, the <i>Bismark</i> , Germany's strongest ship, was greatly feared by the British. So they sent an enormous force to track it down and sink it. A multiscenario game that's a bit clumsy to play; your plans can fail if your hand-eye coordination misfires. —DELSON	Reviewed on C 64/128. Also for 64K Apple, Atari. Joystick recommended.	Y	★	★	★	★	A	★ ★	
PLUNDERED HEARTS Infocom 125 CambridgePark Drive Cambridge, MA 02140 (617) 492-6000 \$35-\$40 ©1987	In this unique text adventure, you're a 17th century Englishwoman who searches for her kidnapped father and falls in love with the dashing Captain Jamison. Romance-novel lovers will enjoy this one, but curling up in bed with a computer is tough. —WILLIAMS	Reviewed on 48K Apple. Also for 512K Amiga, 48K Atari, 512K Atari ST, C 64/128, 256K IBM PC, 512K Macintosh.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★	
PROJECT SPACE STATION Avantage/Accolade, Inc. (see above for address and phone) \$15 ©1986-1987	As director of NASA's Space Station program, you plan, construct, and maintain a self-sustaining or even profitable station engaged in advanced research. The game can be very frustrating—even maddening. But success is well worth the effort. —LANGENDOEN	Reviewed on 64K Apple. Also for C 64/128. Joystick recommended.	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★	
SKYFOX II Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$30 ©1987	This sequel to <i>SkyFox</i> , the hit strategy/arcade game, is as hot as the original. Navigate your souped-up starfighter through space, zapping enemy aliens and asteroids and escorting convoys. Great sound and graphics, and plenty of thrills from start to finish.† —DELSON	C 64/128. Joystick.	Y	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★	
SOLITAIRE ROYALE Spectrum Holobyte 2061 Challenger Drive Alameda, CA 94501 (415) 522-3584 \$35 ©1987	Well-done simulation of solitaire—right down to the sound of the cards being dealt. With three games for children and eight for adults, it's a must-have for solitaire players. Never again will your cards spill off the table mere seconds before you win. —DONAHUE	Reviewed on 512K Macintosh. Also for 256K IBM PC. CGA or EGA (IBM).	Y	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★	
SPACE QUEST II Sierra On-Line, Inc. Sierra On-Line Building Coarsegold, CA 93614 (209) 683-4468 \$50 ©1987	Vohaul, a tyrannical door-to-door salesman, is back and wants revenge. This zany sequel is clever and great fun, but the original was better. We can hardly wait to see what graphic adventure pleasures are in store for us in <i>Space Quest III</i> . —DONAHUE and BELLONE	Reviewed on 256K IBM PC. Also for 512K Amiga, 128K Apple, 512K Atari ST. CGA optional.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★	
STRIKE FLEET Electronic Arts (see above for address and phone) \$30 ©1987	Highly detailed strategy and tactics simulation of contemporary naval warfare that's one of the best games I've seen this year. Players control one ship or an entire fleet in tough, historically accurate situations in such trouble spots as the Persian Gulf.† —DELSON	C 64/128. Joystick recommended.	Y	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★	
TRUST & BETRAYAL Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 \$50 ©1987	A different kind of simulation for gamers who want to become immersed in an intense psychological battle to become the leader of another world and its moon. Uses an attractive and unique user interface. Requires a great deal of time and energy to succeed.† —DONAHUE	512K Macintosh. 800K disk drive.	Y	★ ★	★ ★	★ ★	★ ★ ★	A	★ ★	

RATINGS KEY O Overall performance; D Documentation; PS Play System; GQ Graphics Quality; EU Ease of Use; V Value for money; O Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not Applicable; E Easy; A Average; D Difficult; CP Copy Protected, yes or no; † Longer review follows chart

SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 70 for information such as copy protection and addresses of software publishers.

BUSINESS & PRODUCTIVITY

Freeway

HARDWARE REQUIREMENTS: 384K IBM PC

PUBLISHER: Kortek, Inc.

PRICE: \$60

Are you a newcomer to communications who's looking for a good entry program? If your answer is yes, take a look at *Freeway*—an easy-to-use package that brings the complexities of going on-line down to earth by means of menus, on-line help, an autopilot, a page editor, and a line editor.

Everything you could possibly want to do with your modem can be found on one of the six menus. From dialing a phone number to sending and receiving files to capturing text as it appears on the screen, all you need to do is choose the appropriate menu item. The program will then take you where you want to go. If you accidentally select the wrong menu item, just press ESC and you'll go back to the previous menu.

The publisher recognizes that beginners always need help and has included precise pop-up, on-line help for each menu item. In some cases, you will be referred to other menu items.

The autopilot—a feature that makes going on-line simple—records your log-on sequence and plays it back every time you log on afterwards, saving you from errors and extra keystrokes. The autopilot does have some quirks, however. First, you can't edit the sequence. If you change your password, you must record the sequence again. In addition, the autopilot not only remembers your keystrokes, but also the speed at which you typed them. When I first recorded the sequence, I typed slowly to avoid making mistakes; *Freeway* now types the sequence just as slowly.

Also included is a page editor and a line editor. The page editor lets you compose messages either before going on-line or while on-line. This

saves you from dealing with the hard-to-use editors of many communications services. The line editor remembers your last 10 commands in a session, so you can recycle them or edit a command without retyping.

Overall, *Freeway* deserves serious consideration by beginners or those who want a good, elementary communications program.

Kortek also publishes *Freeway's* big brother, *Freeway Advanced*, which is similar to *Freeway*, but it adds a command interface for menus when they're no longer needed and a command language for writing script files. The command language is difficult to use, and, unfortunately, the extra chapter in the manual is just a reference and does not explain how to write command files. If you need a command language or don't want to use menus, then I would suggest you look elsewhere.

—PASQUALE M. CIRULLO

Grammatik II

HARDWARE REQUIREMENTS: 128K IBM PC

PUBLISHER: Reference Software

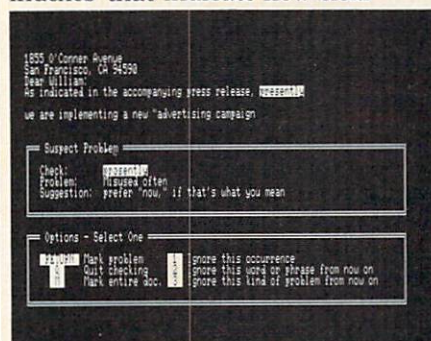
PRICE: \$89

The accompanying literature says it's not a grammar checker or a style checker. I'm not sure I agree with either statement. The literature says it's a writing tool. I do agree with that. *Grammatik II* uses internally programmed English language rules to analyze your word-processed documents, then suggests ways to "improve" your writing. These suggestions are only that, suggestions. You may accept or reject them. There are times when you might intentionally use a redundant or pretentious phrasing for effect.

The program begins by reading your document and its internal phrase dictionaries. The opening screen presents you with a list of options on how the program should review a document. You can, for example, indicate which dictionaries you want to use. This affects the types of problems that are found. For instance, you might include a financial-jargon dictionary that you created to catch problems specific to your writing. *Grammatik II* includes an editor to personalize the phrase dictionaries. You can also set the program to ignore blocks of text. This permits you to skip such things as quotes or tables. You can set the program to stop each time it en-

counters an "error." That way you can see the problem in context and decide if it actually is a mistake.

After reviewing the document, *Grammatik II* offers a summary screen. The top part of the screen shows Grade Level and Reading Ease indexes that indicate how clear



your writing is. Sentence statistics—such as the number of sentences, the average length, the longest and shortest, the number of long and short sentences, and how many end in "?" or "!"—are displayed, as are the number of words and their average length.

The documentation includes a manual for the program and a short course on writing. The manual is written in a comfortable, conversational tone and covers each part of the program, explaining how to customize it to your specific needs. The short course on writing shows how to use other programs, such as outliners and spelling checkers, to improve your writing.

Writing is very personal, an expression of yourself. When it's criticized, it can be constructive, but it can also be uncomfortable. A program that reviews your writing is as impersonal a critic as you could ask for. If you want to improve your writing, and are willing to accept criticism, I recommend this program. I would also counsel you to be critical in your evaluation, both of the document *Grammatik II* is working on and the suggestions the program makes.

—BROOKS H. HUNT

Javelin 1.1

HARDWARE REQUIREMENTS: 512K IBM PC

PUBLISHER: Javelin Software Corp.

PRICE: \$100

The electronic spreadsheet—Lotus 1-2-3, for example—has become so firmly established that it would seem quixotic to market a program whose aim is to outmuscle 1-2-3 and other

SOFTWARE REVIEWS

classics of the type. Indeed, *Javelin* contains a full-blown spreadsheet, but the program's "philosophy" is quite different from that of the old standbys (which are mainly calculators). *Javelin* is a financial-information storehouse with which you model business problems from several perspectives, called *Views*.

Javelin provides 10 *Views* for looking at the same model—for example, a company's sales history and projections for the coming year. In most cases, the information contained in a given *View* can be changed, and the automatic recalculation feature will make the necessary adjustments throughout *Javelin*. The *Views* include *Diagram* (a flowchart showing the relationship of variables, such as cost and margins), *Chart* (a bar chart representing the values of a single variable), *Worksheet* (a standard spreadsheet), *Errors* (a listing of incorrectly written formulas), and *Graph* (presentation-quality graphs, such as line, bar, and pie).

The size of the program and the thickness of the reference manual tell you that *Javelin* is probably not going to be mastered in one afternoon. But the program is so rational that it should take you no more than a few hours to understand its logic and appreciate its capabilities. Despite *Javelin*'s size and complexity, the *View* system allows you to work out your model in easily managed chunks that can be combined into as large a model as you wish. *Javelin* also has a rich supply of built-in templates that merely require you to plug in your own numbers. Thus, the tedium associated with spreadsheet work has been minimized or eliminated.

To assure that you make the transition from your current spreadsheet system—or from no knowledge of spreadsheets—to *Javelin*, it comes with a demonstration disk, a complete on-screen course called "Case Studies," and an easy-to-follow printed *Guide to Learning Javelin*.

For instance, in a typical *Javelin* case study you set the model's time span and format, enter formulas (in plain English), enter data in *Table* and *Chart Views*, calculate the model automatically, display the results on the *Worksheet*, modify the model, and save it. The *Guide* includes comments on each of these on-screen tutorials. You probably won't

need to crack the 344-page main reference book until you start to work on complicated models. In most cases, the on-line, context-sensitive help feature will do the job.

One of *Javelin*'s most thoughtful features is its ability to accept variables or formulas written in plain English. Thus, you can name a sequence "Net Profit = Total Sales - Total Commissions - Total Salaries." Further, you can set up as many subset worksheets as you like, incorporating them into a larger sheet whenever needed. At any time, you can call up the *Diagram View* to look at the relationships you've been developing in your model.

If you're truly happy with 1-2-3 or any program of its type, then it may not be worth your time or your money to switch to *Javelin*. Yet it could be that what takes you considerable effort in 1-2-3 can be handled with considerably less effort in *Javelin*. Furthermore, *Javelin* offers a highly efficient multidimensional approach to business analysis and problem solving. Both are significant considerations. Add in the low cost, and you have a nearly irresistible example of genuinely innovative software, well suited for the home office. The cost/benefit ratio? Very favorable.

Note: Also available is *Javelin Plus* (\$249), an upgraded package that incorporates all the features in the version reviewed here and adds several more. New capabilities include date functions such as day, week, and month; advanced graphics capabilities (with PostScript printer support); and access to DOS commands without exiting from *Javelin*.

—HENRY F. BEECHHOLD

EDUCATION & CREATIVITY

American Discovery

HARDWARE REQUIREMENTS: 512K Macintosh

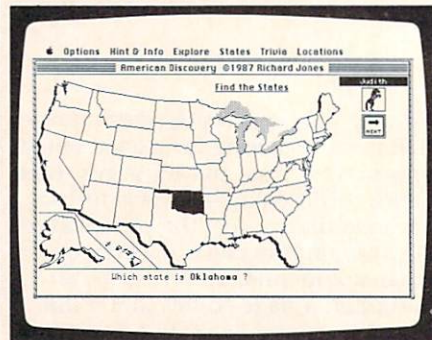
PUBLISHER: Great Wave Software

PRICE: \$70

Are you a geography trivia buff? If so, what is the capital of New Hampshire? What is the official bird of New York? Can you place Oklahoma in its proper location on a United States map? Do you know that archaeological digs have found that Indians lived 8,000 years ago in what is now West Virginia? All these elements and more are part of *Ameri-*

can Discovery.

Both educational and entertaining, *American Discovery* can be played by one or two players; and scores can be competitive (with an on-screen horse race that graphically keeps score, complete with race-track sound effects). For users 9 years old and up, the program provides much motivation to learn United States geography and a potpourri of historical facts.



Upon booting the program, a full U.S. map is drawn on-screen. The basic game involves finding the states on the map. But the program offers more than just state identification; you can choose to explore a specific region. Select a state in that region and get such information as its capital, state flower, and so on. Click on the "info" icon to open a text window that presents historical facts comparable to a short encyclopedia entry.

You can also choose from a variety of games. Try to identify an individual state by name and then spell its name. If you forget to start the name with a capital letter, you are reminded that proper nouns require one. Or look at the outline of a state and try to name its capital. If you're not sure of the state, the program will give you a hint. Further options, such as "neighbor" and "rivers and lakes," give you greater tests of your geography skills.

But real trivia buffs want more! They can select from a list of 17 files ranging from American Indians to Presidents to Sports to Commerce to Plants and Critters to Women. They can also create new trivia files and add maps.

American Discovery is comprehensive and a very good value. The publisher even asks users to submit ideas for trivia and locations lists. This is one program that probably won't gather dust on your shelf.

—JUDITH ZORNBERG



UNIVERSAL MILITARY SIMULATOR

You may never buy another war game. "One's first impression of UMS is that of awe. The computer-generated topographical battlefields, the highly playable nature of the game, and the very flexible nature of the construction set come together to give us the impression that UMS is definitely a breakthrough product."

That's what the wargame experts at Computer Gaming World say about UMS. They also like UMS' high-tech graphics...

"...the three-dimensional topographical views of the battlefield offer a unique perspective in computer gaming. The ability to look at the entire map from eight different compass points is, to our knowledge, unique."

"...the power and flexibility..."
 "...the program's constructability allows for tremendous flexibility. Not only can players design their own maps, orders of battle and objectives, but players who feel that certain units are too strong, too fast, or too experienced can

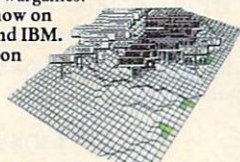
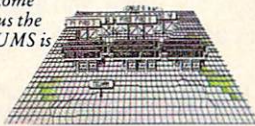
adjust those with the powerful editor...the program truly does allow almost any historical, fantasy or science fiction battle to be created."

"...gamers will appreciate the program inclusion of elements such as terrain, elevation, weaponry, morale, status, and unit efficiency in its calculations."

"...and to sum it all up..."
 "...we want to say that this is a cutting edge product that all computer wargamers will want to play."

Universal Military Simulator. It's the new standard in wargames.

Available now on Atari ST and IBM. Coming soon on Amiga and Mac.

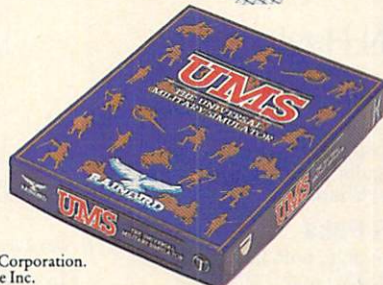


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SOFTWARE REVIEWS

ENTERTAINMENT

Skyfox II: The Cygnus Conflict

HARDWARE REQUIREMENTS: C 64/128

PUBLISHER: Electronic Arts

PRICE: \$30



Just as *Skyfox* helped breathe new life into the flight-simulator field, *Skyfox II* should pump excitement into outer-space shoot-'em-ups. This sequel to one of gamedom's favorite games far exceeded our expectations. It's a fast-paced, edge-of-your-seat quest for glory that never stops delivering thrills and visual excitement from start to finish.

Just blast out of your friendly

neighborhood space station and take on any one of 10 different assignments, each of which can be played at one of five levels, from Cadet to Ace of the Base. Your *Skyfox II* cockpit keeps track of a dozen different elements, such as energy consumption, shield level, damage, autopilot condition, ammo supply, and target indicator. There are various scales of space radar to help you find and track your enemies, as well as targeting sights for your weapons.

The game looks great, too. There are star fields, of course, but the program also includes a hairy new element: asteroid fields. In order to navigate through certain parts of the game universe, you must survive high-speed chases and dogfights in the middle of a moving rock garden! It's like the great chase through the asteroid field in the *Star Wars* movie, *The Empire Strikes Back*.

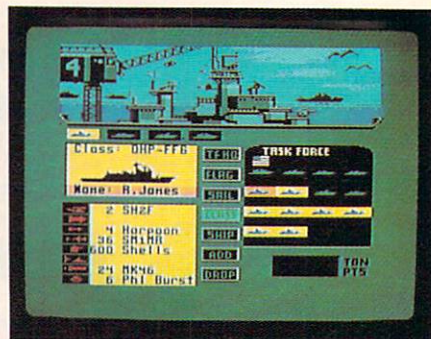
—JAMES DELSON

Strike Fleet

HARDWARE REQUIREMENTS: C 64/128

PUBLISHER: Lucasfilm Games/Electronic Arts

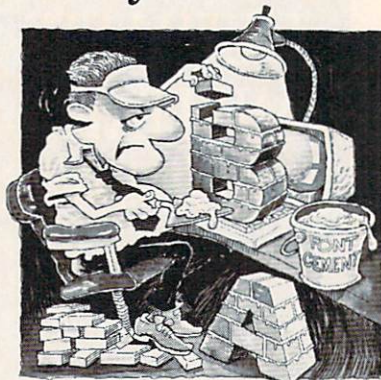
PRICE: \$30



This time, Lucasfilm Games has come up with a real winner. *Strike Fleet*, a naval strategy-and-tactics simulation, is as exciting a program as you're likely to find today, with so many options and so much to do that it also ranks as the best team game I've played so far in 1988.

Set in the present, the game offers hypothetical naval missions for solo players or teams. (I always favor team play for naval games, as it's more fun, and you tend to do much better when different people share the workload.) You lead as few as one ship or as many as a fleet of 16 into action, controlling them individually or in groups. There are dan-

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SOFTWARE REVIEWS

gerous escort missions, attack and defense situations, raids, and holding actions—all set at the beginning of World War III in such trouble spots as the Persian Gulf.

Using a graphics and play system similar to another Lucasfilm naval simulation, *PHM Pegasus* (both games were created by the same design team), all commands are easily learned and menu-driven from your joystick. There's also a pause control if you need to confer with your team in the midst of heavy combat.

Strike Fleet is a winner for all levels of gamers. It delivers a variety of scenarios, great graphics and sound, and an easy-to-learn play system. It can be played and replayed many times without repeating experiences.

—JAMES DELSON

Trust & Betrayal: The Legacy of Siboot

HARDWARE REQUIREMENTS: 512K Macintosh

PUBLISHER: Mindscape, Inc.

PRICE: \$50

Okay, yes, *Trust & Betrayal* has been called (by another reviewer) "the breakthrough game/simulation

of 1987"; and, yes, designer Chris Crawford (of *Balance of Power* fame) did exercise enormous imagination and development genius to put this game together; and, yes, the program does have a unique user interface that looks mighty pretty on the screen—but let's just calm down a little and take a deep breath.

The much-talked-about *Trust & Betrayal* is aptly named: Figuring out who you can trust, who trusts you, who will betray you, and who you should betray take up a major portion of your time. You, that is, being a lumpy, antennae creature named Vetvel who looks like an accordion with a face. You and six other acolytes on the moon Kira are vying for the coveted position of Shepherd of Kira whose duty is to tend the spiritual, educational, and political needs of Kira and its mother planet, Lamina.

Each night, all the acolytes go into a dream zone to do battle. Using information gathered during daylight hours, you must decide which auras your opponents will attack with and what you should use to counter their attacks. A victory drains part

of an aura from the loser and transfers it to the victor. You may have several battles in one evening, and the battles continue until one of the acolytes has a perfect set of auras and becomes the next Shepherd.

The emphasis of the game, however, is on the deals you strike with your motley band of friends and associates between battles. You interact with these beings (who resemble chess pieces, ant eaters, pterodactyls, and worse) through an icon-based language called "Eeyal." This means that the gamer must string together pictures of what you're talking about to create meaningful sentences. While the language is fairly easy to understand, it takes some getting used to, and the translations tend to sound like Indians from old John Wayne movies ("Laughing Dog walk many moons").

I was not floored by this game. But that doesn't mean that some people won't love it. *Trust & Betrayal* can be enjoyable if the amount of fun and satisfaction you get from the game justifies the time involved and the concentration required to play successfully.

—JEFF DONAHUE

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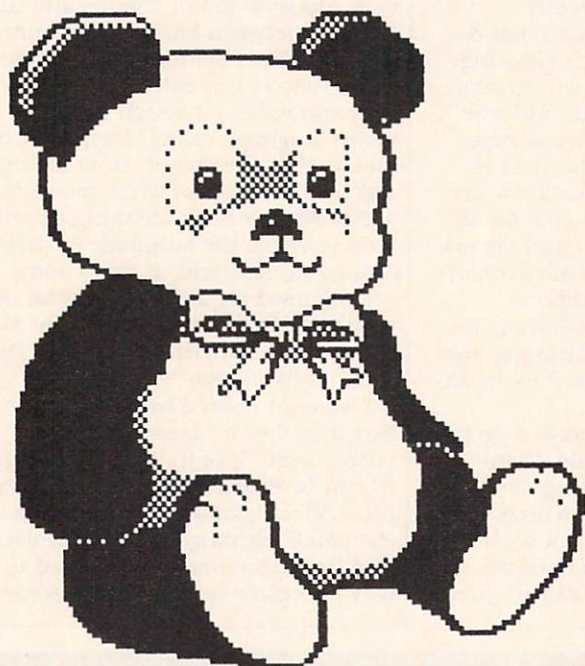


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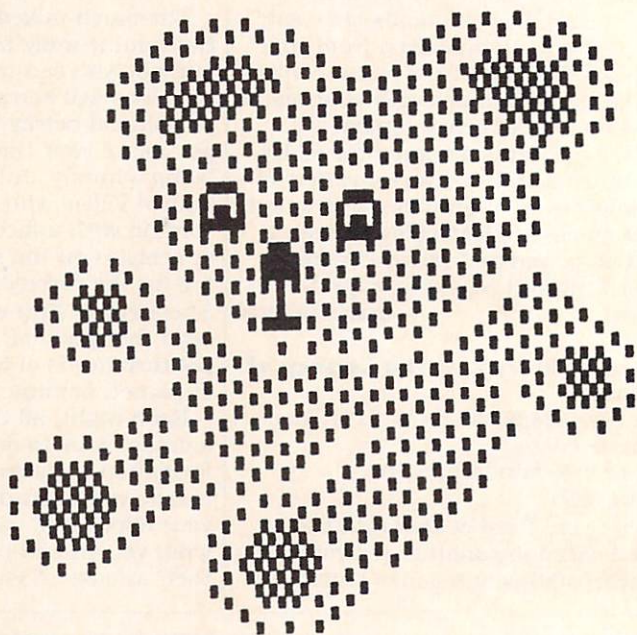
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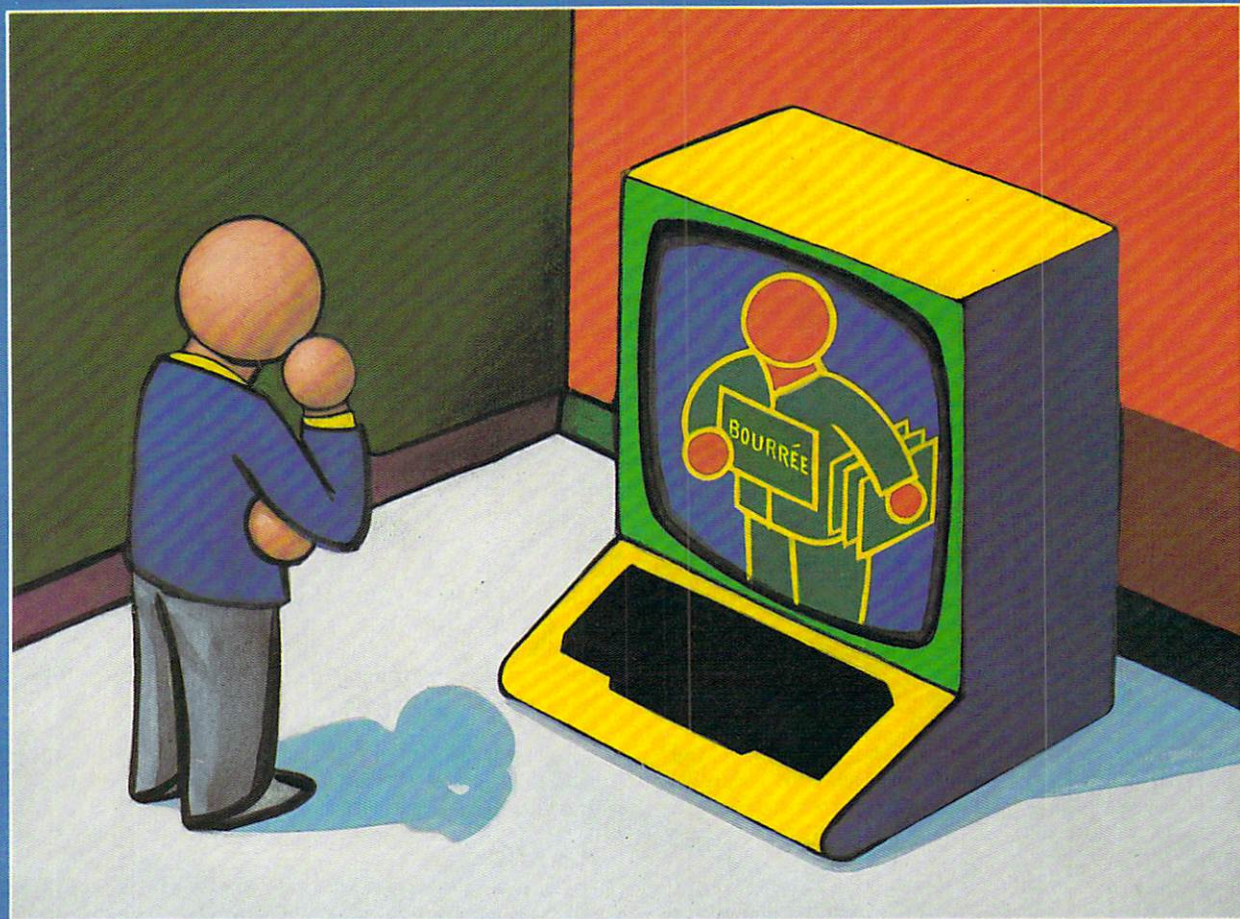
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THE PROGRAMMER



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FYI

Throughout The Programmer, find news for programmers, information about our programs, "Tips to the Typist," and "Programming P.S."

FUN LEARNING

Page 80

Our *Flashcards* program helps create a computerized version of the cards you used in school.

MICROTONES

Page 89

Sit back and relax to our version of Bach's *Bourrée*.

Computers†	Flashcards	Bourrée
APPLE FAMILY		
APPLE II/PLUS/e/GS	★ p	★
MACINTOSH		★
COMMODORE 64/128	★ p	★
IBM PC FAMILY		
IBM PC	★ p	★
IBM PC/r	★ p	★ T
IBM PS/2 Model 30	★ p	★
IBM PC COMPATIBLES		
BLUE CHIP PERSONAL COMPUTER	★ p	★
COMMODORE PC 10	★ p	★
EPSON EQUITY I	★ p	★
KAYPRO PC-10	★ p	★
LEADING EDGE MODEL D	★ p	★
PANASONIC FX-600	★ p	★
TANDY 1000 EX	★ p	★
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KEY: ★ PROGRAM IN THIS ISSUE FOR THIS COMPUTER. + SEE PG 92 FOR SPECIFIC MODELS. T TELEVISION OR MONITOR WITH SPEAKER REQUIRED. p PRINTER OPTIONAL.

FLASHCARDS

BY JEFF DONAHUE

Are you looking for a fun way to memorize foreign phrases, historical dates, mathematical equations, and vocabulary or spelling words? Maybe you just want to keep track of some interesting facts you gather. And how about a method of reminding yourself about relatives' birthdays?

You can now stop looking! Our *Flashcards* program can handle these topics and many more. *Flashcards* is a computerized version of the commercial or handmade flashcards you used in school, with the advantage of being able to customize them to suit your needs. *Flashcards* provides an easy way to store and print any card file you create. You can even



take a FLASHTEST to see how much you really know about a particular subject.

USING FLASHCARDS

It's simple to use *Flashcards*. Once you have entered the program correctly in BASIC, SAVE it, and then RUN it. From the FLASHCARD FILE SELECTION menu, you can choose to either SPECIFY A FLASHCARD FILE, CATALOG THE DISK, or QUIT.

If you wanted to create a new file, add to an old file, or test yourself on an existing file, you would choose the first option. Once you enter a file name, the program will check to see if that file already exists. If there is a file with that name, it will be loaded and you will be at the FLASHCARD OPTIONS menu. If the program cannot find a match on the disk, it brings you to the CREATE A FLASHCARD FILE screen.

The second menu option shows you a catalog of all the files on your disk, and the third option returns you to BASIC.

NEW FILES

You have two options when creating a new file. One of the choices provides up to 400 flashcards that each consist of 1 line, 20 characters long, on each side of the card. When you need a little more space on each card, choose the other option, which allows up to 200 cards each with 2 lines of 20 characters on each side.

After you've made your choice, an index card will be drawn on the screen. The file name and the card number will appear above the index card, while the cursor instructions will be across the bottom of the screen. The top of the card is labeled FRONT, and the bottom is labeled BACK. The cursor will appear on the first line of the FRONT side. You may then enter a line of 20 characters or numbers (no control characters, please!), using DELETE or the BACKSPACE-DELETE ARROW to erase any mistakes.

When you are satisfied with the line, press RETURN, ENTER, or the DOWN ARROW to move to the next line.

If you chose to have 2 lines on each side of the card, the cursor will move to the second line; otherwise, it will move to the first line of the BACK.

Enter your text on the BACK of the card, and check for any mistakes. By pressing the UP ARROW key, you can go up a line, or you can press RETURN or ENTER until the cursor is at the line you want.

When you're satisfied, press the ESCAPE key, or the BACK ARROW key on the Commodore, to save what you've entered, and create a second card. After you're through creating your cards, press CTRL-E to exit to the *Flashcards* work screen.

Displayed in inverse video at the bottom of this work screen are the 8 commands you'll use to work with the file you've just created or loaded from the disk.

COMMANDS

To choose one of these commands, you must press the corresponding number key at the command line.

1) Prev. Card

Moves you backward through the card file.

2) Next Card

Moves you forward through the card file.

3) Add

Lets you add cards to the end of the file.

4) Flip

Turns over all of the cards in the file, letting you browse through the fronts or the backs of the cards.

5) Delete

Erases any card you specify. Useful for eliminating any blank cards that you may have accidentally saved.

6) Print

Allows you to either print out the card you are viewing or print the entire file. The cards are printed in such a way that you can cut them out, fold them in half, and have the questions on one side and the answers on the other.

7) Edit

Places you in the editor, so you can change any card you have already created.

8) Menu

Returns you to the FLASHCARD OPTIONS menu, after asking whether or not you want to save the cards. This is the only place where you can save your cards to disk.

FLASHTEST

When you take a FLASHTEST, the computer will first ask you whether your answers must precisely duplicate what is written on the cards or whether paraphrases are allowed. Next, you must decide whether you want to be quizzed on the FRONT or the BACK side of the cards.

Once you have made these decisions, you will be tested on all the cards in the file in a random order. The screen will clear, a card will be drawn, and the cursor will appear beneath the space labeled YOUR ANSWER. Instructions on cursor movement will be displayed on screen.

Once you have entered your answer, press ESCAPE to see if it is correct, or press CTRL-Q to return to the FLASHCARD OPTIONS menu. Your answer will be checked automatically, unless you chose paraphrases. In this case, the correct answer shows on the screen, and you must tell the computer whether your answer is right or wrong. You will be retested on any questions that you answered incorrectly.

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Apple II series/Flashcards

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10 DIM AS(4),FCS(400,4),LBS(5)
20 DIM CP(4),F(4),LY(4),RA(400)
30 HOME:PRINT "ONE MOMENT, PLEASE ...":ONERR GOTO 320
40 C = 1:CA = 0:FB = 0:LN = 1
50 BS = CHR$(7):DS = CHR$(4):LS = "-"
60 PSS = "PRESS ANY KEY. ":QS = CHR$(34):RS = CHR$(13)
70 SS = CHR$(32):FOR I = 1 TO 5:READ LBS(I):NEXT I
80 FOR I = 1 TO 4:LY(I) = 14
90 IF I/2 = INT(I/2) THEN LY(I) = LY(I)+2
100 NEXT I:FOR X = 1 TO 20:SP$ = SP$+SS:DS$ = DS$+LS
110 NEXT X:FOR X = 1 TO 27:H$ = H$+" ":V$ = V$+SS
120 NEXT X:V$ = "!"+"V$+"!":FOR X = 1 TO 39:J$ = J$+LS
130 PS = PS+SS:NEXT X:J$ = J$+"!"+J$:PS = PS+"!"
140 TLS = "FLASHCARD FILE SELECTION":GOSUB 2000:MD = 1
150 VTAB 5:PRINT "1) SPECIFY A FLASHCARD FILE":RS
160 PRINT "2) CATALOG THE DISK":RS:PRINT "3) QUIT":RS
170 MX = 3:GOSUB 2500:IF K = 3 THEN HOME:END
180 IF K <> 2 THEN 200
190 PRINT DS;"CATALOG":PRINT PSS;:GET X$:GOTO 140
200 GOSUB 3000:INPUT "WHAT IS THE NAME OF THIS FLASHCARD FILE?":NFS
210 PRINT DS;"OPEN":NFS:PRINT DS;"READ":NFS
220 INPUT NC:INPUT MC:FOR X = 1 TO NC
230 FOR Y = 1 TO 4:INPUT FCS(X,Y)
240 NEXT Y,X:PRINT DS;"CLOSE":NFS:GOSUB 3500
250 TLS = "FLASHCARD OPTIONS":GOSUB 2000
260 VTAB 5:PRINT "1) WORK WITH THE CURRENT FILE":RS
270 PRINT "2) TAKE A FLASHTEST":RS
280 PRINT "3) RETURN TO MAIN MENU":RS
290 MX = 3:GOSUB 2500
300 IF K = 3 THEN CLEAR:RESTORE:GOTO 40
310 ON K GOTO 480,930
320 PRINT:PRINT DS;"CLOSE":E = PEEK(222)
330 IF E = 5 THEN 370
340 HOME:PRINT "ERROR #";E;" HAS OCCURRED ";
350 PRINT "IN LINE ";X = PEEK(219)*256+PEEK(218)
360 PRINT X;".":RS:PSS;:GET X$:GOTO 250
370 TLS = "CREATE A FLASHCARD FILE":GOSUB 2000:MD = 2
380 PRINT "YOU MUST PICK HOW MANY LINES OF TEXT"
390 PRINT "YOU WANT ON EACH SIDE OF THE CARDS"
400 PRINT "(THERE ARE 20 CHARACTERS ON EACH LINE).":
410 VTAB 8:PRINT " # OF":TAB(15);"# OF LINES # OF LINES"
420 PRINT " CARDS":TAB(18);LBS(1);TAB(32);LBS(2)
430 PRINT DS$;DS$
440 PRINT "1) 200":TAB(20);"2":TAB(34);"2":RS
450 PRINT "2) 400":TAB(20);"1":TAB(34);"1"
460 MX = 2:GOSUB 2500:MC = K:NC = 1:C = 1:GOSUB 2000
470 GOSUB 3500:GOSUB 4000
480 TLS = "WORK WITH A FLASHCARD FILE":GOSUB 2000
490 VTAB 22:INVERSE
500 PRINT "1) PREV. CARD 3) ADD 5) DELETE 7) EDIT"
510 PRINT "2) NEXT CARD 4) FLIP 6) PRINT 8) MENU"
520 NORMAL:MD = 1:GOSUB 5000:GOSUB 5500
530 GOSUB 6000:PRINT "COMMAND: ";MX = 8:GOSUB 2510
540 ON K GOTO 550,550,580,600,610,700,830,860
550 C = C+(K = 2)-(K = 1)
560 IF C < 1 OR C > NC THEN C = C-(K = 2)+(K = 1)
570 GOSUB 5500:GOTO 530
580 MD = 2:C = NC+(NC < MC*200):NC = C
590 GOSUB 4000:GOSUB 3000:GOTO 490
600 FB = NOT FB:GOTO 520
610 GOSUB 6000:PRINT "DELETE CARD-> ";C;:HTAB 15
620 GOSUB 6500:IF K > NC OR K = 0 THEN 530
630 C = K:GOSUB 6000:PRINT "PRESS <RETURN> TO DELETE CARD ";K;:GET K$:IF K$ <> RS THEN 530
640 FOR X = K TO NC:FOR Y = 1 TO 4
650 FCS(X,Y) = FCS(X+(K < NC),Y):NEXT Y,X
660 FOR I = 1 TO 4:FCS(NC,I) = "":NEXT I
670 NC = NC-1
680 IF NC > 0 THEN GOSUB 6000:PRINT "NO MORE CARDS LEFT.":RUN
690 C = NC:GOSUB 5500:GOTO 530
700 GOSUB 6000
710 PRINT "PRINT 1) THIS CARD 2) ENTIRE FILE ";

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720 MX = 2:GOSUB 2510:P = K:GOSUB 6000
730 PRINT "TURN PRINTER ON; THEN ";PSS;:GET K$
740 S = 1:E = NC:PRINT:IF P = 1 THEN S = C:E = C
750 PRINT DS;"PR#1":FOR I = S TO E
760 PRINT J$:FOR X = 1 TO 6:PRINT PS:NEXT X
770 PRINT SPC(9);FCS(I,1);SPC(30-LEN(FCS(I,1)));"!";SPC(9);FCS(I,3)
780 PRINT PS:IF MC = 2 THEN PRINT PS:GOTO 800
790 PRINT SPC(9);FCS(I,2);SPC(30-LEN(FCS(I,2)));"!";SPC(9);FCS(I,4)
800 FOR X = 1 TO 6:PRINT PS:NEXT X:IF P = 1 THEN 820
810 IF I/4 = INT(I/4) THEN PRINT J$:PRINT
820 NEXT I:PRINT J$:PRINT:PRINT DS;"PR#0":GOTO 480
830 GOSUB 6000:PRINT "EDIT CARD-> ";C;:HTAB 13
840 GOSUB 6500:IF K > NC OR K = 0 THEN 530
850 C = K:MD = 3:GOSUB 5000:GOSUB 4000:GOTO 480
860 GOSUB 6000:PRINT "SAVE THESE CARDS? ";
870 GOSUB 7000:IF K$ <> "Y" AND K$ <> "N" THEN 870
880 IF K$ = "N" THEN 250
890 PRINT:PRINT DS;"OPEN":NFS:PRINT DS;"WRITE":NFS
900 PRINT NC:PRINT MC:FOR X = 1 TO NC:FOR Y = 1 TO 4
910 PRINT QS;FCS(X,Y);QS:NEXT Y,X:PRINT DS;"CLOSE":NFS
920 GOTO 250
930 TLS = "FLASHTEST":GOSUB 2000:MD = 4:Q = 0:TG = 0
940 VTAB 5:PRINT "DO YOU WANT YOUR ANSWERS TO BE":RS
950 PRINT "1) EXACT MATCHES OR":RS;"2) PARAPHRASES"
960 MX = 2:GOSUB 2500:MM = K-1:GOSUB 2000:VTAB 5
970 PRINT "WHICH SIDE OF THE CARDS WOULD YOU LIKE"
980 PRINT "TO BE TESTED ON?":PRINT
990 PRINT "1) THE FRONT 2) THE BACK "
1000 GOSUB 2500:FB = K-1:GOSUB 2000:GOSUB 5000
1010 C = INT(RND(1)*NC)+1:IF RA(C) THEN 1010
1020 RX = 5:BG = 3:ND = 3+(MC = 1)
1030 IF FB THEN BG = 1:ND = 1+(MC = 1)
1040 PT = BG:GOSUB 5500:GOSUB 4020:FOR I = 1 TO 4
1050 AS(I) = "":NEXT I:IF Q THEN 1070
1060 TG = TG+1:IF CA <> NC THEN 1010
1070 GOSUB 3000:GOSUB 6000
1080 PRINT "YOU GOT ";CA;" OUT OF ";NC;" CORRECT IN ";
1090 PRINT TG;" TRIES.":PRINT PSS;:GET X$
1100 FOR I = 1 TO NC:RA(I) = 0:GOTO 250
2000 HOME:PRINT TAB(INT((40-LEN(TLS))/2));
2010 INVERSE:PRINT TLS;RS;RS:NORMAL:RETURN
2500 PRINT RS;RS;"PLEASE CHOOSE AN OPTION: ";
2510 GET K$:K = VAL(K$):IF K < 1 OR K > MX THEN 2510
2520 PRINT K:RETURN
3000 VTAB 18:FOR I = 1 TO 6:PRINT SPC(40):NEXT I
3010 VTAB 20:HTAB 1:RETURN
3500 IF NOT MC THEN FOR X = 1 TO 10:READ A:NEXT X
3510 READ MX,LC:FOR M = 1 TO LC:READ CP(M),F(M)
3520 NEXT M:RETURN
4000 GOSUB 5000:GOSUB 5500:VTAB 18
4010 PRINT SP$:SP$:BG = 1:ND = 2+(2*(MC = 1)):PT = BG
4020 GOSUB 3000
4030 PRINT "USE UP/DOWN ARROWS OR RETURN TO MOVE,"
4040 PRINT "DELETE OR <- TO ERASE, AND ESC TO CONT."
4050 VTAB 19:INVERSE
4060 IF MD = 4 THEN PRINT "CTRL-Q TO QUIT"
4070 IF MD = 2 THEN PRINT "CTRL-E TO QUIT"
4080 NORMAL
4090 TS = FCS(C,F(PT)):IF MD = 4 THEN TS = AS(PT)
4100 LN = LEN(TS)
4110 IF MD = 4 THEN VTAB LY(PT):GOTO 4130
4120 VTAB CP(PT)
4130 HTAB 9:IF LN < 20 THEN PRINT TS;RIGHT$(DS$,20-LN)
4140 IF MD = 4 THEN VTAB LY(PT):GOTO 4160
4150 VTAB CP(PT)
4160 HTAB LN+9:GET K$:IF K$ = CHR$(27) THEN 4330
4170 IF K$ = CHR$(17) AND MD = 4 THEN Q = 1:RETURN
4180 IF K$ = CHR$(127) OR K$ = CHR$(8) THEN 4300
4190 IF K$ = CHR$(5) AND MD = 2 THEN FCS(C,F(PT)) = TS
:GOSUB 5000:RETURN
4200 DY = (K$ = RS OR K$ = CHR$(10))-(K$ = CHR$(11))
4210 IF DY <> 0 AND MD <> 4 THEN FCS(C,F(PT)) = TS:GOTO 4270
4220 IF DY <> 0 AND MD = 4 THEN AS(PT) = TS:GOTO 4270

```



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4230 IF K$ < S$ OR LN = 20 THEN PRINT B$;GOTO 4140
4240 T$ = T$+K$:PRINT K$:LN = LN+1
4250 IF MD = 4 THEN AS(PT) = T$:GOTO 4270
4260 FCS(C,F(PT)) = T$:GOTO 4090
4270 PT = PT+DY:IF PT < BG THEN PT = ND
4280 IF PT > ND THEN PT = BG
4290 GOTO 4090
4300 IF LN = 0 THEN PRINT B$;GOTO 4140
4310 IF LN = 1 THEN LN = 0:T$ = "":GOTO 4110
4320 LN = LN-1:T$ = LEFT$(T$,LN):GOTO 4110
4330 IF MD = 4 THEN RETURN
4340 FCS(C,F(PT)) = T$
4350 IF MD = 2 AND C < 200*MC THEN C = C+1:NC = C
4360 IF MD = 2 THEN RETURN
4370 GOSUB 5000:RETURN
4380 IF MM THEN 4460
4390 IF AS(BG) = FCS(C,BG) AND AS(ND) = FCS(C,ND) THEN
  RA(C) = 1:CA = CA+1:RX = 4
4400 GOSUB 3000:PRINT LB$(RX):PRINT PSS;
4410 GET X$:IF RX = 4 THEN RETURN
4420 IF MM THEN 4460
4430 GOSUB 3000:GOSUB 6000
4440 PRINT "DO YOU WANT TO SEE THE ANSWER? ";
4450 GOSUB 7000:IF K$ <> "Y" THEN RETURN
4460 FB = NOT FB:GOSUB 5500:GOSUB 3000
4470 IF NOT MM THEN PRINT PSS;GET X$:GOTO 4500
4480 PRINT "DID YOU GET THIS RIGHT? ";GOSUB 7000
4490 IF K$ = "Y" THEN RA(C) = 1:CA = CA+1:RX = 4
4500 FB = NOT FB:RETURN
5000 VTAB 5:HTAB 6:PRINT H$
5010 FOR X = 6 TO 16:HTAB 5:PRINT V$:NEXT X
5020 HTAB 5:PRINT "!" ;H$;"!"
5030 VTAB 4:HTAB 5:PRINT N$:RETURN
5500 VTAB 8:FOR X = 8 TO 16:HTAB 9:PRINT SP$:NEXT X
5510 VTAB 4:HTAB 26:PRINT "CARD ";C;" "
5520 IF MD = 4 THEN 5610
5530 IF MD > 1 THEN 5570
5540 VTAB 18:HTAB 17:PRINT LB$(FB+1)
5550 VTAB 10:HTAB 9:PRINT FCS(C,1+(2*(FB = 1)))
5560 VTAB 12:HTAB 9:PRINT FCS(C,2+(2*(FB = 1))):RETURN
5570 VTAB 6:HTAB 17:PRINT LB$(1)
5580 VTAB 12:HTAB 17:PRINT LB$(2)
5590 FOR I = 1 TO LC
5600 VTAB CP(I):HTAB 9:PRINT FCS(C,I):NEXT I:RETURN
5610 VTAB 6:HTAB 17:PRINT LB$(FB+1):VTAB 12:HTAB 14
5620 PRINT LB$(3)
5630 GOSUB 3000:FOR I = BG TO ND:VTAB LY(I):HTAB 9
5640 PRINT AS(I):NEXT I:VTAB 8
5650 HTAB 9:PRINT FCS(C,1+(2*(FB = 1))):VTAB 10
5660 HTAB 9:PRINT FCS(C,2+(2*(FB = 1))):RETURN
6000 VTAB 20:HTAB 10:PRINT SP$:SP$:SP$:LEFT$(SP$,10);
6010 VTAB 20:HTAB 1:RETURN
6500 INPUT "K$";K$:IF K$ = "" THEN K = C:RETURN
6510 K = VAL(K$):RETURN
7000 GET K$:K = ASC(K$)
7010 K$ = CHR$(K-32*(K > 96)*(K < 123)):RETURN
7500 DATA FRONT,"BACK",YOUR ANSWER
7510 DATA CORRECT,INCORRECT
8000 DATA 200,4,8,1,10,2,14,3,16,4,400,2,8,1,14,3

```

Commodore 64 & 128 (C 64 mode)/Flashcards

```

10 DIM A$(4),BK$(2),FCS(400,4),LB$(5)
20 DIM CP(4),F(4),LY(4),RA(400)
30 POKE 53280,6:POKE 53281,6:POKE 646,1
40 C=1:CA=0:FB=0:LN=1:NW=0:HMS=CHR$(147)
50 PRINT HMS;"ONE MOMENT, PLEASE ..."
60 E$=CHR$(125):L$="-":NV$=CHR$(18):NMS=CHR$(146)
70 PSS="PRESS ANY KEY. ":Q$=CHR$(34):R$=CHR$(13)
80 S$=CHR$(32):FOR I=1 TO 5:READ LB$(I):NEXT I
90 BK$(1)=CHR$(45):BK$(2)=NV$+BK$(1)+NMS
100 FOR X=1 TO 4:LY(X)=14
110 IF X/2=INT(X/2) THEN LY(X)=LY(X)+2
120 NEXT X:SP$=S$:DSS=L$

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130 FOR X=2 TO 20:SP$=SP$+S$:DSS=DSS+L$:NEXT X
140 FOR X=1 TO 27:H$=H$+CHR$(99):V$=V$+S$
150 NEXT X:V$=E$+V$+E$:FOR X=1 TO 39:J$=J$+L$
160 PS=PS+S$:NEXT X:J$=J$+"!"+J$:PS=PS+"!"
170 TP$=CHR$(176)+H$+CHR$(174)
180 BT$=CHR$(173)+H$+CHR$(189)
190 TL$="FLASHCARD FILE SELECTION":GOSUB 2000:MD=1
200 RO=5:CO=0:GOSUB 1500
210 PRINT "1) SPECIFY A FLASHCARD FILE";RS
220 PRINT "2) CATALOG THE DISK";R$:PRINT "3) QUIT";R$
230 MX=3:GOSUB 2500:IF K=3 THEN PRINT HMS:END
240 IF K=1 THEN 310
250 CLOSE 2:OPEN 2,8,0,"S":PRINT HMS;"DISK NAME: ";
260 GET #2,T$:IF T$=CHR$(199) THEN CLOSE 2:GOTO 300
270 IF T$=CHR$(34) THEN F=NOT F:ON -F GOTO 260:PRINT:G
OTO 260
280 IF F THEN PRINT T$;
290 GOTO 260
300 PRINT RS:PSS;:GOSUB 3000:GOTO 190
310 RO=17:GOSUB 1500:INPUT "WHAT IS THE NAME OF THIS F
LASHCARD FILE";NFS
320 IF NFS="" THEN 310
330 CLOSE 3:OPEN 3,8,3,NFS+"",S,R":CLOSE 3
340 OPEN 15,8,15:INPUT#15,E:CLOSE 15
350 IF E=62 OR E=4 THEN 490
360 IF E<>0 THEN 470
370 OPEN 3,8,3,NFS+"",S,R":INPUT#3,NC:INPUT#3,MC
380 FOR X=1 TO NC:FOR Y=1 TO 4:INPUT#3,FCS(X,Y)
390 NEXT Y,X:CLOSE 3:GOSUB 4000
400 TL$="FLASHCARD OPTIONS":GOSUB 2000:RO=5:CO=1
410 GOSUB 1500
420 PRINT "1) WORK WITH THE CURRENT FILE";R$
430 PRINT "2) TAKE A FLASHTEST";R$
440 PRINT "3) RETURN TO MAIN MENU";R$
450 MX=3:GOSUB 2500:ON K GOTO 620,1100,460
460 CLR:RESTORE:GOTO 40
470 PRINT HMS;"ERROR #";E;" HAS OCCURRED."
480 FOR X=1 TO 2000:NEXT X:GOTO 190
490 TL$="CREATE A FLASHCARD FILE":GOSUB 2000
500 MD=2:NW=-1
510 PRINT "YOU MUST PICK HOW MANY LINES OF TEXT"
520 PRINT "YOU WANT ON EACH SIDE OF THE CARDS"
530 PRINT "(THERE ARE 20 CHARACTERS ON EACH LINE)."
540 RO=8:CO=0:GOSUB 1500
550 PRINT " # OF";TAB(15);"# OF LINES # OF LINES"
560 PRINT " CARDS";TAB(18);LB$(1);TAB(32);LB$(2)
570 PRINT DSS;DSS
580 PRINT "1) 200";TAB(20);"2";TAB(34);"2";R$
590 PRINT "2) 400";TAB(20);"1";TAB(34);"1"
600 MX=2:GOSUB 2500:MC=K:NC=1:C=1:GOSUB 2000
610 GOSUB 4000:GOSUB 4500
620 TL$="WORK WITH CURRENT FILE":GOSUB 2000
630 RO=22:CO=0:GOSUB 1500
640 PRINT NV$;"1) PREV. CARD 3) ADD 5) DELETE 7) EDIT
"
650 PRINT NV$;"2) NEXT CARD 4) FLIP 6) PRINT 8) MENU
";NMS;
660 MD=1:GOSUB 5000:GOSUB 5500
670 GOSUB 6000:PRINT "COMMAND: ";MX=8:GOSUB 2510
680 ON K GOTO 690,690,720,740,750,840,970,1000
690 C=C-(K=2)+(K=1)
700 IF C<1 OR C>NC THEN C=C+(K=2)-(K=1)
710 GOSUB 5000:GOSUB 5500:GOTO 670
720 MD=2:C=NC-(NC<MC*200):NC=C
730 GOSUB 4500:GOSUB 3500:GOTO 630
740 FB=NOT FB:GOTO 660
750 GOSUB 6000:PRINT "DELETE CARD->";C;:CO=14
760 GOSUB 1500:GOSUB 6500:GOSUB 6000
770 PRINT "PRESS <RETURN> TO DELETE CARD";K;
780 GOSUB 3000:IF K<>R$ THEN 670
790 FOR X=K TO NC:FOR Y=1 TO 4
800 FCS(X,Y)=FCS(X-(K<NC),Y):NEXT Y,X
810 FOR X=1 TO 4:FCS(NC,X)="" :NEXT X:NC=NC-1
820 IF NC=0 THEN GOSUB 6000:PRINT "NO MORE CARDS LEFT.
";R$:PSS;GOSUB 3000:GOTO
830 C=NC:GOSUB 5500:GOTO 670

```


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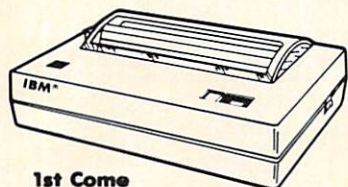
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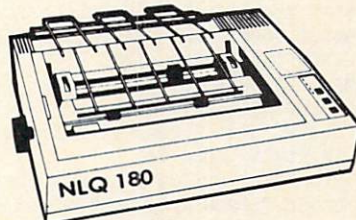
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FUN LEARNING

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840 GOSUB 6000
850 PRINT "PRINT 1) THIS CARD 2) ENTIRE FILE ";
860 MX=2:GOSUB 2510:P=K:GOSUB 6000
870 PRINT "TURN PRINTER ON; THEN ";PSS;:GOSUB 3000
880 S=1:E=NC:PRINT:IF P=1 THEN S=C:E=C
890 OPEN 4,4:CMD4:FOR Y=S TO E
900 PRINT JS:FOR X=1 TO 6:PRINT PS:NEXT X
910 PRINT SPC(9);FCS(Y,1);SPC(30-LEN(FCS(Y,1)));";";SP
C(9);FCS(Y,3)
920 PRINT PS:IF MC=2 THEN PRINT PS:GOTO 940
930 PRINT SPC(9);FCS(Y,2);SPC(30-LEN(FCS(Y,2)));";";SP
C(9);FCS(Y,4)
940 FOR X=1 TO 6:PRINT PS:NEXT X:IF P=1 THEN 960
950 IF Y/4=INT(Y/4) THEN PRINT JS:PRINT
960 NEXT Y:PRINT JS:PRINT#4:CLOSE4:GOTO 620
970 GOSUB 6000:PRINT "EDIT CARD->";C;:CO=12
980 GOSUB 1500:GOSUB 6500
990 MD=3:GOSUB 4500:GOTO 620
1000 GOSUB 6000:PRINT "SAVE THESE CARDS? ";
1010 GOSUB 7000:IF K<>"Y" AND K<>"N" THEN 1010
1020 IF K="N" THEN 400
1030 PVS="":IF NOT NW THEN PVS="a0:"
1040 CLOSE 3:OPEN 3,8,3,PVS+NFS+"",S,W":CLOSE 3
1050 CLOSE 15:OPEN 15,8,15:INPUT#15,E:CLOSE 15
1060 IF E<>0 THEN 470
1070 CLOSE 3:OPEN 3,8,3,PVS+NFS+"",S,W":PRINT#3,NC
1080 PRINT#3,MC:FOR X=1 TO NC:FOR Y=1 TO 4
1090 PRINT#3,QS:FCS(X,Y);QS:NEXT Y,X:CLOSE 3:GOTO 400
1100 TL$="FLASHTEST":GOSUB 2000:MD=4:Q=0:TG=0
1110 RO=5:CO=0
1120 PRINT "DO YOU WANT YOUR ANSWERS TO BE";RS
1130 PRINT "1) EXACT MATCHES OR";RS;"2) PARAPHRASES"
1140 MX=2:GOSUB 2500:MM=1-K:GOSUB 2000
1150 RO=5:CO=0:GOSUB 1500
1160 PRINT "WHICH SIDE OF THE CARDS WOULD YOU LIKE"
1170 PRINT "TO BE TESTED ON?":PRINT
1180 PRINT "1) THE FRONT 2) THE BACK "
1190 GOSUB 2500:FB=1-K:GOSUB 2000:GOSUB 5000
1200 C=INT(RND(1)*NC)+1:IF RA(C) THEN 1200
1210 RX=5:BG=3:ND=3-(MC=1)
1220 IF FB THEN BG=1:ND=1-(MC=1)
1230 PT=BG:GOSUB 4510:FOR I=1 TO 4
1240 AS(I)="":NEXT I:IF Q THEN 1260
1250 TG=TG+1:IF CA<>NC THEN 1200
1260 GOSUB 3500:GOSUB 6000
1270 PRINT "YOU GOT";CA;"OUT OF";NC;"CORRECT IN";
1280 PRINT TG;"TRIES.":PRINT PSS;:GOSUB 3000
1290 FOR X=1 TO NC:RA(X)=0:NEXT X:GOTO 400
1500 POKE 214,RO-1:PRINT:PRINT TAB(CO);:RETURN
2000 PRINT CHR$(147);TAB(INT((39-LEN(TL$))/2));
2010 PRINT NVS;TL$;NMS;RS;RS:RETURN
2500 PRINT RS;RS; "PLEASE CHOOSE AN OPTION: ";
2510 GET K$:IF VAL(K$)<1 OR VAL(K$)>MX THEN 2510
2520 PRINT K$:K=VAL(K$):RETURN
3000 GET K$:IF K$="" THEN 3000
3010 RETURN
3500 RO=18:CO=0:GOSUB 1500:FOR I=1 TO 6
3510 PRINT SP$;LEFT$(SP$,19):NEXT I
3520 RO=20:CO=0:GOSUB 1500:RETURN
4000 IF MC=2 THEN FOR X=1 TO 10:READ A:NEXT X
4010 READ MX,LC:FOR M=1 TO LC:READ CP(M),F(M)
4020 NEXT M:RETURN
4500 BG=1:ND=2-2*(MC=1):PT=BG
4510 GOSUB 3500:GOSUB 5000:GOSUB 5500
4520 RO=19:CO=0:GOSUB 1500
4530 IF MD=4 THEN PRINT NVS;"CTRL-Q TO QUIT";NMS
4540 IF MD=2 THEN PRINT NVS;"CTRL-E TO QUIT";NMS
4550 PRINT "USE UP/DOWN ARROWS OR RETURN TO MOVE,"
4560 PRINT "DELETE TO ERASE, AND <- TO CONTINUE"
4570 TS=FCS(C,F(PT)):IF MD<4 THEN RO=CP(PT):GOTO 4590
4580 TS=AS(PT):RO=LY(PT)
4590 LN=LEN(TS):CO=9:GOSUB 1500
4600 IF LN<20 THEN PRINT TS;RIGHT$(DS$,20-LN)
4610 CO=LN+9:GOSUB 1500:GET K$:IF K$<>" " THEN 4630
4620 PRINT BK$(2):GOSUB 1500:PRINT BK$(1):GOTO 4610
4630 IF K$=CHR$(95) THEN 4800

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4640 IF K$=CHR$(17) AND MD=4 THEN Q=1:RETURN
4650 IF K$=CHR$(157) OR K$=CHR$(20) THEN 4770
4660 IF K$=CHR$(5) AND MD=2 THEN FCS(C,F(PT))=TS:GOSUB
5000:RETURN
4670 DY=(K$=CHR$(145))-(K$=R$ OR K$=CHR$(17))
4680 IF DY<>0 AND MD<>4 THEN FCS(C,F(PT))=TS:GOTO 4740
4690 IF DY<>0 AND MD=4 THEN AS(PT)=TS:GOTO 4740
4700 IF K$<S$ OR LN=20 THEN 4610
4710 TS=TS+K$:PRINT K$:LN=LN+1
4720 IF MD<4 THEN FCS(C,F(PT))=TS:GOTO 4570
4730 AS(PT)=TS
4740 PT=PT+DY:IF PT<BG THEN PT=ND
4750 IF PT>ND THEN PT=BG
4760 GOTO 4570
4770 IF LN=0 THEN 4610
4780 IF LN=1 THEN LN=0:TS="":GOTO 4590
4790 LN=LN-1:TS=LEFT$(TS,LN):GOTO 4590
4800 IF MD=4 THEN 4850
4810 FCS(C,F(PT))=TS
4820 IF MD=2 AND C<200*MC THEN C=C+1:NC=C
4830 IF MD=2 THEN 4500
4840 GOSUB 5000:RETURN
4850 IF MM THEN FB=NOT FB:GOTO 4960
4860 IF AS(BG)=FCS(C,BG) AND AS(ND)=FCS(C,ND) THEN RA(
C)=1:CA=CA+1:RX=4
4870 GOSUB 3500:PRINT LB$(RX):PRINT PSS;
4880 GOSUB 3000:IF RX=4 THEN RETURN
4890 GOSUB 3500
4900 PRINT "DO YOU WANT TO SEE THE ANSWER? ";
4910 GOSUB 7000:IF K$<>"Y" THEN RETURN
4920 FB=NOT FB:GOSUB 5000:GOSUB 5500
4930 GOSUB 6000:PRINT PSS;
4940 GET X$:IF X$="" THEN 4940
4950 GOTO 4990
4960 GOSUB 5000:GOSUB 5500:GOSUB 6000
4970 PRINT "DID YOU GET THIS RIGHT? ";
4980 GOSUB 7000:IF K$="Y" THEN RA(C)=-1:CA=CA+1:RX=4
4990 FB=NOT FB:RETURN
5000 RO=5:CO=5:GOSUB 1500:PRINT TPS
5010 FOR X=6 TO 16:RO=X:GOSUB 1500:PRINT VS:NEXT X
5020 PRINT TAB(5);BTS
5030 RO=4:CO=5:GOSUB 1500:PRINT NFS:RETURN
5500 RO=8:FOR X=8 TO 16:CO=9:GOSUB 1500
5510 PRINT SP$:NEXT X
5520 RO=4:CO=26:GOSUB 1500:PRINT "CARD";STR$(C);" "
5530 ON MD GOTO 5540,5580,5580,5630
5540 RO=18:CO=17:GOSUB 1500:PRINT LB$(1-FB)
5550 RO=10:CO=9:GOSUB 1500:PRINT FCS(C,1-(2*(FB=-1)))
5560 RO=12:CO=9:GOSUB 1500:PRINT FCS(C,2-(2*(FB=-1)))
5570 RETURN
5580 RO=6:CO=17:GOSUB 1500:PRINT LB$(1)
5590 RO=11:CO=17:GOSUB 1500:PRINT LB$(2)
5600 FOR X=1 TO LC:RO=CP(X):CO=9:GOSUB 1500
5610 PRINT FCS(C,X);LEFT$(SP$,20-LEN(FCS(C,X)))
5620 NEXT X:RETURN
5630 RO=6:CO=17:GOSUB 1500:PRINT LB$(1-FB):RO=12:CO=14
5640 GOSUB 1500:PRINT LB$(3):GOSUB 3500
5650 FOR X=BG TO ND:RO=LY(X):CO=9:GOSUB 1500
5660 PRINT AS(X):NEXT X:RO=8:CO=9:GOSUB 1500
5670 PRINT FCS(C,1-(2*(FB=-1))):RO=10:CO=9:GOSUB 1500
5680 PRINT FCS(C,2-(2*(FB=-1))):RETURN
6000 RO=20:CO=8:GOSUB 1500:PRINT SP$;LEFT$(SP$,11)
6010 PRINT SP$;LEFT$(SP$,19)
6020 RO=20:CO=0:GOSUB 1500:RETURN
6500 TMS="":FOR X=1 TO 3
6510 GOSUB 3000:IF K$=R$ THEN X=3:GOTO 6540
6520 IF K$<"0" AND K$>"9" THEN 6510
6530 TMS=TMS+K$:GOSUB 1500:PRINT TMS;" "
6540 NEXT X:K=VAL(TMS):IF TMS="" THEN K=C
6550 IF K>NC OR K=0 THEN 670
6560 C=K:RETURN
7000 GOSUB 3000
7010 K=ASC(K$):K$=CHR$(K-32*(K>96)*(K<123)):RETURN
10000 DATA FRONT,"BACK","YOUR ANSWER
10010 DATA CORRECT,INCORRECT
10100 DATA 200,4,8,1,10,2,13,3,15,4,400,2,8,1,13,3

```


IBM PC & compatibles/Flashcards

```

10 DEF SEG=8H40
20 IF (PEEK(8H10) AND 48)=32 THEN WIDTH 40
30 DEF SEG:DIM AS(2),FCS(400,4),LBS(3)
40 DIM CP(4),LP(2),RA(400):LOCATE ,0:KEY OFF
50 COLOR 2,0:CLS:C=1:FB=0:RS=CHRS(13):SS=CHRS(32)
60 FOR L=1 TO 3:READ LBS(L):NEXT L
70 H1$=CHRS(201)+STRING$(27,205)+CHRS(187)
80 H2$=CHRS(200)+STRING$(27,205)+CHRS(188)
90 J$=STRING$(39,45)+"I"+STRING$(39,45)
100 PS=SPACES(39)+"I"+SPACES(20)
110 VS=CHRS(186)+STRING$(27,32)+CHRS(186)
120 TL$="FLASHCARD FILE SELECTION":GOSUB 2000:MD=1
130 LOCATE 5,1:PRINT "1) Specify a flashcard file";RS
140 PRINT "2) Catalog the disk";RS:PRINT "3) Quit";RS
150 MX=3:GOSUB 2500:ON K GOTO 210,170,160
160 CLS:END
170 ON ERROR GOTO 190
180 CLS:FILES:GOSUB 3500:GOTO 120
190 ER=ERR:EL=ERL:RESUME 200
200 ON ERROR GOTO 0:GOSUB 4000:GOTO 120
210 LOCATE 20,1:INPUT "What is the name of this flashcard file";NF$
220 ON ERROR GOTO 310
230 OPEN NF$ FOR INPUT AS #1:INPUT#1,MC,NC
240 GOSUB 4500:FOR X=1 TO NC:FOR Y=1 TO LC
250 INPUT#1,FCS(X,Y):NEXT Y,X:CLOSE#1:ON ERROR GOTO 0
260 TL$="FLASHCARD OPTIONS":GOSUB 2000:LOCATE 5,1
270 PRINT "1) Work with the current file";RS
280 PRINT "2) Take a flashtest";RS
290 PRINT "3) Return to main menu";RS
300 MX=3:GOSUB 2500:ON K GOTO 450,1010:RUN
310 CLOSE#1:ER=ERR:EL=ERL:RESUME 320
320 ON ERROR GOTO 0:IF ER<53 THEN GOSUB 4000:GOTO 120
330 TL$="CREATE A FLASHCARD FILE":GOSUB 2000:MD=2
340 PRINT "You must pick how many lines of text"
350 PRINT "you want on each side of the cards"
360 PRINT "(there are 20 characters on each line)."
```

```

370 LOCATE 8,5
380 PRINT "# OF";TAB(15);"# OF LINES # OF LINES"
390 PRINT TAB(5);"CARDS";TAB(18);LBS(1);TAB(32);LBS(2)
400 PRINT STRING$(39,196)
410 PRINT "1) 200";TAB(20);"2";TAB(34);"2";RS
420 PRINT "2) 400";TAB(20);"1";TAB(34);"1"
430 MX=2:GOSUB 2500:MC=K:NC=1:C=1:GOSUB 2000
440 GOSUB 4500:GOSUB 5000:GOSUB 8500
450 TL$="WORK WITH A FLASHCARD FILE":GOSUB 2000
460 COLOR 1,3:LOCATE 22,1
470 PRINT "1) PREV. CARD 3) ADD 5) DELETE 7) EDIT"
480 PRINT "2) NEXT CARD 4) FLIP 6) PRINT 8) MENU"
490 COLOR 2,0:MD=1:GOSUB 5000:GOSUB 5500
500 GOSUB 6000:PRINT "COMMAND:";MX=8:GOSUB 2510
510 ON K GOTO 520,520,550,570,580,710,870,910
520 C=C+(K=1)-(K=2)
530 IF C<1 OR C>NC THEN BEEP:C=C-(K=1)+(K=2):GOTO 500
540 GOSUB 5500:GOTO 500
550 MD=2:C=NC-(NC<MC*200):NC=C:GOSUB 6500
560 GOSUB 5000:GOSUB 8500:GOSUB 7000:GOTO 460
570 FB=NOT FB:GOSUB 5500:GOTO 500
580 LOCATE 20,1:PRINT "DELETE CARD->";C:T=15
590 GOSUB 7500:IF K>NC OR K=0 THEN BEEP:GOTO 500
600 C=K:GOSUB 6000
610 PRINT "Press <ENTER> to delete card.";
620 GOSUB 3000:IF K<>RS THEN 500
630 IF NC=1 THEN 660
640 FOR X=K TO NC:FOR Y=1 TO LC
650 FCS(X,Y)=FCS(X-(K<NC),Y):NEXT Y,X
660 FOR L=1 TO LC:FCS(NC,L)="" :NEXT L
670 NC=NC-1:IF NC>0 THEN 700
680 GOSUB 7000:LOCATE 20,1:PRINT "No more cards left."
690 GOSUB 3500:RUN
700 C=NC:GOSUB 5500:GOTO 500
710 LOCATE 20,1
720 PRINT "PRINT 1) THIS CARD 2) ENTIRE FILE ";
730 MX=2:GOSUB 2510:P=K:LOCATE 20,1
740 PRINT "Turn printer on; then press any key.";
```

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```

750 GOSUB 3000:LOCATE 20,1:PRINT SPACES(39)
760 IF P=1 THEN S=C:E=C ELSE S=1:E=NC
770 ON ERROR GOTO 850:WIDTH "LPT1:",80
780 FOR L=S TO E:LPRINT JS:FOR X=1 TO 6:LPRINT PS
790 NEXT X:T=3-MC:FOR X=1 TO T
800 LPRINT SPC(9);FC$(L,X);SPC(30-LEN(FC$(L,X)));";";S
PC(9);FC$(L,X+T)
810 LPRINT PS:NEXT X:IF MC=2 THEN LPRINT PS:GOTO 820
820 FOR X=1 TO 6:LPRINT PS:NEXT X:IF P=1 THEN 840
830 IF L MOD 4=0 THEN LPRINT JS:LPRINT
840 NEXT L:IF (L-1) MOD 4<>0 THEN LPRINT JS:LPRINT:GOT
O 450 ELSE 450
850 ER=ERR:EL=ERL:RESUME 860
860 ON ERROR GOTO 0:BEEP:LOCATE 20,1:GOTO 740
870 LOCATE 20,1:PRINT "EDIT CARD->";C:T=13
880 GOSUB 7500:IF K>NC OR K=0 THEN BEEP:GOTO 500
890 C=K:MD=3:GOSUB 6500:GOSUB 5000
900 GOSUB 8500:GOSUB 7000:GOTO 460
910 GOSUB 6000:PRINT "Save these cards? ";
920 GOSUB 8000:IF K$="N" THEN 260
930 IF K$<>"Y" THEN BEEP:GOTO 920
940 ON ERROR GOTO 990
950 OPEN NF$ FOR OUTPUT AS #1
960 WRITE#1,MC,NC:FOR X=1 TO NC:FOR Y=1 TO LC
970 WRITE#1,FC$(X,Y):NEXT Y,X:CLOSE#1
980 ON ERROR GOTO 0:GOTO 260
990 ER=ERR:EL=ERL:RESUME 1000
1000 ON ERROR GOTO 0:GOSUB 4000:GOTO 450
1010 TL$="FLASHTEST":GOSUB 2000
1020 CA=0:MD=4:Q=0:TG=0:LOCATE 5,1
1030 PRINT "Do you want your answers to be ...":PRINT
1040 PRINT "1) Exact matches or";RS;"2) Paraphrases"
1050 MX=2:GOSUB 2500:MM=1-K:GOSUB 2000:LOCATE 5,1
1060 PRINT "Which side of the cards would you like"
1070 PRINT "to be tested on?":PRINT
1080 PRINT "1) The front 2) The back"
1090 GOSUB 2500:FB=K-2:GOSUB 2000:GOSUB 5000
1100 C=INT(RND*NC)+1:IF RA(C) THEN 1100
1110 BG=LP(1-FB):ND=BG-(MC=1):GOSUB 5500
1120 BG=1:ND=LC/2:PT=1:GOSUB 8510:FOR L=1 TO 2
1130 AS(L)="":NEXT L:IF Q THEN 1150
1140 TG=TG+1:IF CA<NC THEN 1100
1150 GOSUB 7000:LOCATE 20,1:PRINT "You got";CA;"out of
";NC;"correct in";TG;"tries."
1160 GOSUB 3500:FOR L=1 TO NC:RA(L)=0:NEXT L:GOTO 260
2000 CLS:COLOR 15:PRINT TAB(INT(20-LEN(TL$)/2));TL$
2010 PRINT:COLOR 2:RETURN
2500 PRINT RS;RS;"PLEASE CHOOSE AN OPTION:";
2510 GOSUB 3000:K=VAL(K$)
2520 IF K<1 OR K>MX THEN BEEP:GOTO 2510
2530 PRINT K:RETURN
3000 K$=INKEY$:IF K$="" THEN 3000 ELSE RETURN
3500 PRINT "Press any key.":GOSUB 3000:RETURN
4000 CLS:COLOR 4:PRINT "Error #";ER;"has occurred in l
ine";STR$(EL);"."
4010 COLOR 2:GOSUB 3500:RETURN
4500 IF MC=2 THEN FOR X=1 TO 8:READ A:NEXT X
4510 READ MX,LC:FOR X=1 TO LC:READ CP(X):NEXT X
4520 FOR X=1 TO 2:READ LP(X):NEXT X:RETURN
5000 LOCATE 4,6:PRINT NF$:PRINT TAB(6);H1$
5010 FOR X=1 TO 12:PRINT TAB(6);V$:NEXT X
5020 PRINT TAB(6);H2$:RETURN
5500 LOCATE 4,27:PRINT "CARD";C;SS;SS
5510 ON MD GOTO 5520,5540,5540,5580
5520 COLOR 11:LOCATE 18,18:PRINT LBS(1-FB)
5530 COLOR 2:T=10:GOTO 5620
5540 COLOR 11:LOCATE 6,18:PRINT LBS(1)
5550 LOCATE 12,18:PRINT LBS(2):COLOR 2
5560 FOR L=1 TO LC:TS=FC$(C,L):LOCATE CP(L),10
5570 PRINT TS;STRINGS(20-LEN(TS),95):NEXT L:RETURN
5580 COLOR 11:LOCATE 6,18:PRINT LBS(1-FB)
5590 LOCATE 12,15:PRINT LBS(3):COLOR 2
5600 FOR L=1 TO LC/2:LOCATE 12+L*2,10
5610 PRINT AS(L);STRINGS(20-LEN(AS(L)),95):NEXT L:T=8
5620 Z=LP(1-FB):FOR L=Z TO Z-(MC=1):LOCATE T,10
5630 TS=FC$(C,L):PRINT TS;SPACES(20-LEN(TS))

```

```

5640 T=T+2:NEXT L:RETURN
6000 LOCATE 20,9:PRINT SPACES(30):LOCATE 20,1:RETURN
6500 FOR L=22 TO 23:LOCATE L,1:PRINT SPC(39)
6510 NEXT L:RETURN
7000 FOR L=19 TO 21:LOCATE L,1:PRINT SPC(39)
7010 NEXT L:RETURN
7500 TS=""
7510 GOSUB 3000:IF K$=RS THEN 7550
7520 IF K$<"0" OR K$>"9" OR LEN(TS)>3 THEN BEEP:GOTO 7
510
7530 IF TS="" THEN LOCATE 20,T:PRINT SPC(3):LOCATE 20,
T
7540 PRINT K$;TS=TS+K$:GOTO 7510
7550 IF TS="" THEN K=C:RETURN
7560 K=VAL(TS):RETURN
8000 GOSUB 3000:K=ASC(K$)
8010 K$=CHR$(K-32*(K>96)*(K<123)):RETURN
8500 GOSUB 5500:BG=1:ND=LC:PT=BG
8510 LOCATE 20,1
8520 PRINT "Use <CURSOR UP/DOWN>/<ENTER>=Move"
8530 PRINT "<BACKSPACE>=Erase <ESC>=Continue"
8540 COLOR 14:LOCATE 19,1
8550 IF MD=4 THEN PRINT "<CTRL>+<Q>=Quit":GOTO 8570
8560 IF MD=2 THEN PRINT "<CTRL>+<E>=Exit"
8570 COLOR 2
8580 IF MD=4 THEN TS=AS(PT) ELSE TS=FC$(C,PT)
8590 LN=LEN(TS)
8600 IF MD=4 THEN YP=12+PT*2 ELSE YP=CP(PT)
8610 LOCATE YP,10:PRINT TS;STRINGS(20-LN,95)
8620 LOCATE YP,10+LN
8630 K$=INKEY$:IF K$<>" " THEN 8680
8640 LOCATE YP,10+LN:PRINT CHR$(219)
8650 LOCATE YP,10+LN
8660 IF LN=20 THEN PRINT SS:GOTO 8620
8670 PRINT " ":GOTO 8620
8680 IF LEN(K$)=1 THEN 8730
8690 K$=MID$(K$,2):DY=(K$="H")-(K$="P")
8700 IF DY=0 THEN BEEP:GOTO 8620
8710 IF MD<4 THEN FC$(C,PT)=TS:GOTO 8840
8720 AS(PT)=TS:GOTO 8840
8730 IF K$=CHR$(27) THEN 8860
8740 IF K$=CHR$(17) AND MD=4 THEN Q=-1:RETURN
8750 IF K$<>CHR$(8) THEN 8780
8760 IF LN=0 THEN BEEP:GOTO 8620
8770 LN=LN-1:TS=LEFT$(TS,LN):GOTO 8600
8780 IF K$<>CHR$(5) THEN 8810
8790 IF MD<>2 THEN BEEP:GOTO 8620
8800 FC$(C,PT)=TS:GOSUB 7000:RETURN
8810 IF K$=RS THEN DY=1:GOTO 8710
8820 IF K$<SS OR LN=20 THEN BEEP:GOTO 8620
8830 TS=TS+K$:PRINT K$:LN=LN+1:GOTO 8620
8840 PT=PT+DY:IF PT<BG THEN PT=ND:GOTO 8580
8850 IF PT>ND THEN PT=BG:GOTO 8580 ELSE 8580
8860 GOSUB 7000:IF MD=4 THEN AS(PT)=TS:GOTO 8800
8870 FC$(C,PT)=TS
8880 IF MD=2 AND C<200*MC THEN C=C+1:NC=C
8890 IF MD=2 THEN 8500 ELSE GOSUB 5000:RETURN
8900 IF MM THEN 8980
8910 RX=0:T=LC/2:FOR L=BG TO ND:IF AS(L)=FC$(C,L-(FB=0
)*T) THEN RA(C)=-1:RX=RX+1
8920 NEXT L:IF RX=LC/2 THEN CA=CA+1:RX=-1 ELSE RA(C)=0
:RX=0
8930 LOCATE 20,1:IF RX THEN PRINT "CORRECT!" ELSE PRIN
T "INCORRECT!"
8940 GOSUB 3500:IF RX THEN RETURN
8950 GOSUB 7000:LOCATE 20,1
8960 PRINT "Do you want to see the answer? ";
8970 GOSUB 8000:IF K$<>"Y" THEN RETURN
8980 FB=NOT FB:GOSUB 5500:GOSUB 7000:LOCATE 20,1
8990 IF NOT MM THEN GOSUB 3500:GOTO 9020
9000 PRINT "Did you get this right? ";
9010 GOSUB 8000:IF K$="Y" THEN RA(C)=-1:CA=CA+1
9020 FB=NOT FB:RETURN
9500 DATA "FRONT","BACK ","YOUR ANSWER"
9510 DATA 200,4,8,10,14,16,1,3,400,2,8,14,1,2

```


BOURRÉE

BY JOEY LATIMER

The first time I heard *Bourrée*, by Johann Sebastian Bach, I was listening to an album by the rock group Jethro Tull. It featured band leader Ian Anderson playing his flute, its sound gliding atop a mellow, rolling bass part.

The song popped into my life once again at a friend's beach house. That time it was Julian Bream doing the honors, playing an expanded *Bourrée* on classical guitar. Since then, I've had a hard time getting *Bourrée* out of my head . . . until now.



If you'd like to hear this masterpiece play through your computer, load BASIC and type in the *Bourrée* program. Then, SAVE the program, RUN it, and sit back and listen! So, take a break and enjoy a little Bach at your desk!

Apple II series/Bourrée

```
10 DIM P(174),D(174)
20 HOME:VTAB 12:HTAB 16:PRINT " "
30 VTAB 13:HTAB 11:PRINT "BOURRÉE BY J.S. BACH"
40 FOR X = 0 TO 36:READ A:POKE 768+X,A:NEXT X
50 FOR X = 1 TO 174:READ P(X),D(X):NEXT X
60 FOR X = 1 TO 174:POKE 6,40*D(X):POKE 8,P(X)*2
70 CALL 768:NEXT X:GOTO 60
1000 DATA 165,8,201,2,176,2,169,2,74,133,10,164,8
1010 DATA 240,8,173,48,192,234,234,136,208,251,56
1020 DATA 165,7,229,10,133,7,176,235,198,6,208,231,96
2000 DATA 47,1,42,1,40,2,42,1,47,1,50,2,47,1,42,1,64,2
2010 DATA 57,1,50,1,47,2,53,1,60,1,64,2,72,1,81,1,85,2
2020 DATA 81,1,72,1,64,1,72,1,81,1,85,1,96,2,47,1,42,1
2030 DATA 40,2,42,1,47,1,50,2,47,1,42,1,64,2,57,1,50,1
2040 DATA 47,2,53,1,60,1,64,2,72,1,81,1,85,3,81,1,81,6
2050 DATA 47,1,42,1,40,2,42,1,47,1,50,2,47,1,42,1,64,2
2060 DATA 57,1,50,1,47,2,53,1,60,1,64,2,72,1,81,1,85,2
2070 DATA 81,1,72,1,64,1,72,1,81,1,85,1,96,2,47,1,42,1
2080 DATA 40,2,42,1,47,1,50,2,47,1,42,1,64,2,57,1,50,1
2090 DATA 47,2,53,1,60,1,64,2,72,1,81,1,85,3,81,1,81,6
2100 DATA 64,1,81,1,53,2,72,1,60,1,64,2,40,1,53,1,47,2
2110 DATA 64,1,53,1,60,2,64,1,72,1,76,2,72,1,64,1,60,2
2120 DATA 64,1,72,1,72,6,53,1,72,1,64,2,40,1,53,1,47,2
2130 DATA 64,1,53,1,60,2,35,1,47,1,42,2,57,1,47,1,53,2
2140 DATA 57,1,64,1,68,3,64,1,64,6,31,1,42,1,37,2,42,1
2150 DATA 47,1,35,2,47,1,40,1,42,2,47,1,53,1,40,2,53,1
2160 DATA 45,1,47,2,35,1,47,1,42,2,57,1,47,1,50,2,64,4
2170 DATA 47,1,64,1,60,2,53,1,72,1,64,2,60,1,81,1,72,2
2180 DATA 64,1,85,1,81,2,85,1,96,1,102,2,96,1,85,1
2190 DATA 81,2,85,1,96,1,96,6
```

Commodore 64 & 128 (C 64 mode)/Bourrée

```
10 DIM V1(175,3),V2(144,3)
20 S=54272:FOR I=0 TO 23:POKE S+I,0:NEXT I
30 POKE S+24,10:POKE S+5,31:POKE S+6,241
40 POKE S+12,63:POKE S+13,241
50 FOR X=1 TO 175:READ V1(X,1),V1(X,2),V1(X,3):NEXT X
60 FOR X=1 TO 144:READ V2(X,1),V2(X,2),V2(X,3):NEXT X
70 POKE 53281,0:POKE 53280,5:PRINT CHR$(147);CHR$(5)
80 POKE 214,9:PRINT:PRINT TAB(15);" "
```

```
90 PRINT TAB(10);"BOURRÉE BY J.S. BACH"
100 P1=1:P2=1:T1=0:T2=0
110 POKE S+1,V1(P1,1):POKE S,V1(P1,2)
120 POKE S+8,V2(P2,1):POKE S+7,V2(P2,2)
130 POKE S+4,17:POKE S+11,17
140 FOR D=1 TO 70:NEXT D
150 T1=T1+1:IF T1=V1(P1,3) THEN T1=0:P1=P1+1:POKE S+4,16
160 T2=T2+1:IF T2=V2(P2,3) THEN T2=0:P2=P2+1:POKE S+11,16
170 IF P2<145 THEN 110
180 GOTO 100
1000 DATA 0,0,16,42,62,1,47,107,1,50,60,2,47,107,1
1010 DATA 42,62,1,39,223,2,42,62,1,47,107,1,31,165,2
1020 DATA 35,134,1,39,223,1,42,62,2,37,162,1,33,135,1
1030 DATA 31,165,2,28,49,1,25,30,1,23,181,2,25,30,1
1040 DATA 28,49,1,31,165,1,28,49,1,25,30,1,23,181,1
1050 DATA 21,31,2,42,62,1,47,107,1,50,60,2,47,107,1
1060 DATA 42,62,1,39,223,2,42,62,1,47,107,1,31,165,2
1070 DATA 35,134,1,39,223,1,42,62,2,37,162,1,33,135,1
1080 DATA 31,165,2,28,49,1,25,30,1,23,181,3,25,30,1
1090 DATA 25,30,6,42,62,1,47,107,1,50,60,2,47,107,1
1100 DATA 42,62,1,39,223,2,42,62,1,47,107,1,31,165,2
1110 DATA 35,134,1,39,223,1,42,62,2,37,162,1,33,135,1
1120 DATA 31,165,2,28,49,1,25,30,1,23,181,2,25,30,1
1130 DATA 28,49,1,31,165,1,28,49,1,25,30,1,23,181,1
1140 DATA 21,31,2,42,62,1,47,107,1,50,60,2,47,107,1
1150 DATA 42,62,1,39,223,2,42,62,1,47,107,1,31,165,2
1160 DATA 35,134,1,39,223,1,42,62,2,37,162,1,33,135,1
1170 DATA 31,165,2,28,49,1,25,30,1,23,181,3,25,30,1
1180 DATA 25,30,6,31,165,1,25,30,1,37,162,2,28,49,1
1190 DATA 33,135,1,31,165,2,50,60,1,37,162,1,42,62,2
1200 DATA 31,165,1,37,162,1,33,135,2,31,165,1,28,49,1
1210 DATA 26,156,2,28,49,1,31,165,1,33,135,2,31,165,1
1220 DATA 28,49,1,28,49,6,37,162,1,28,49,1,31,165,2
1230 DATA 50,60,1,37,162,1,42,62,2,31,165,1,37,162,1
1240 DATA 33,135,2,56,99,1,42,62,1,47,107,2,35,134,1
1250 DATA 42,62,1,37,162,2,35,134,1,31,165,1,29,223,3
1260 DATA 31,165,1,31,165,6,63,75,1,47,107,1,53,57,2
1270 DATA 47,107,1,42,62,1,56,99,2,42,62,1,50,60,1
1280 DATA 47,107,2,42,62,1,37,162,1,50,60,2,37,162,1
1290 DATA 44,193,1,42,62,2,56,99,1,42,62,1,47,107,2
1300 DATA 35,134,1,42,62,1,39,223,2,31,165,4,42,62,1
1310 DATA 31,165,1,33,135,2,37,162,1,28,49,1,31,165,2
1320 DATA 33,135,1,25,30,1,28,49,2,31,165,1,23,181,1
1330 DATA 25,30,2,23,181,1,21,31,1,19,239,2,21,31,1
1340 DATA 23,181,1,25,30,2,23,181,1,21,31,1,21,31,6
2000 DATA 12,143,1,11,218,1,10,143,2,14,24,2,15,210,2
2010 DATA 14,24,2,12,143,2,11,218,2,10,143,2,12,143,1
2020 DATA 11,218,1,10,143,2,14,24,2,15,210,2,14,24,2
2030 DATA 12,143,2,11,218,2,10,143,2,11,218,2,12,143,2
2040 DATA 14,24,2,15,210,2,14,24,2,12,143,2,15,210,2
2050 DATA 10,143,1,11,218,1,12,143,1,11,218,1,10,143,2
2060 DATA 14,24,2,15,210,2,14,24,2,12,143,2,11,218,2
2070 DATA 10,143,2,11,218,2,12,143,2,16,195,2,18,209,2
2080 DATA 9,104,2,15,210,6,12,143,1,11,218,1,10,143,2
2090 DATA 14,24,2,15,210,2,14,24,2,12,143,1,11,218,2
2100 DATA 10,143,2,11,218,2,12,143,2,14,24,2,15,210,2
2110 DATA 14,24,2,12,143,2,15,210,2,10,143,1,11,218,1
2120 DATA 12,143,1,11,218,1,10,143,2,14,24,2,15,210,2
2130 DATA 14,24,2,12,143,2,11,218,2,10,143,2,11,218,2
2140 DATA 12,143,2,16,195,2,18,209,2,9,104,2,15,210,6
2150 DATA 12,143,2,11,218,2,9,104,2,12,143,2,15,210,2
2160 DATA 16,195,2,13,78,2,14,24,2,18,209,2,21,31,2
2170 DATA 14,24,2,21,31,2,10,143,2,14,24,1,15,210,1
2180 DATA 14,24,1,12,143,1,11,218,2,9,104,2,12,143,2
2190 DATA 15,210,2,16,195,2,13,78,2,14,24,2,17,195,2
2200 DATA 18,209,2,14,239,2,15,210,2,21,31,2,23,181,2
2210 DATA 11,218,2,15,210,1,14,239,1,15,210,1,17,195,1
2220 DATA 19,239,2,15,210,2,21,31,2,18,209,2,17,195,2
2230 DATA 14,24,2,18,209,2,16,195,2,15,210,2,12,143,2
2240 DATA 16,195,2,15,210,2,14,24,2,11,218,2,15,210,3
2250 DATA 16,195,1,15,210,1,14,24,1,13,78,2,14,24,1
2260 DATA 21,31,1,23,181,2,12,143,1,19,239,1,21,31,2
2270 DATA 11,218,1,17,195,1,19,239,2,10,143,2,14,24,2
2280 DATA 15,210,2,14,24,2,15,210,4,10,143,6
```


IBM PC & compatibles/Bourrée

```

10 DIM A$(10):KEY OFF
20 CLS:LOCATE 10,10
30 PRINT "Bourr";CHR$(130);"e by J.S. Bach"
40 FOR X=1 TO 10:READ A$(X):NEXT X
50 FOR X=1 TO 10:PLAY A$(X):NEXT X:GOTO 50
1000 DATA T14002MBL8EF#G4F#ED#4EF#<B4>C#D#E4
1010 DATA DC<B4>AGF#4GABAGF#E4>EF#G4F#ED#4EF#
1020 DATA <B4>C#D#E4DC<B4>AGF#4.GG2.>EF#G4F#E
1030 DATA D#4EF#<B4>C#D#E4DC<B4>AGF#4GABAGF#
1040 DATA E4>EF#G4F#ED#4EF#<B4>C#D#E4DC<B4>AG
1050 DATA F#4.GG2.D4<A>C<B4>GDE4<B>DC4<BA
1060 DATA G#4AB>C4<BAA2.>D<AB4>GDE4<B>DC4AE
1070 DATA F#4C#ED4C<BA#4.BB2.>BF#G#4F#EA4EG
1080 DATA F#4EDG4DFE4AEF#4C#ED#4<B2>E<B>C4D
1090 DATA <AB4>C<GA4BF#G4F#ED#4EF#G4F#EE2

```

IBM PCjr & compatibles/Bourrée

```

10 DIM A$(13),B$(13):WIDTH 40:KEY OFF:SOUND ON
20 CLS:LOCATE 10,10
30 PRINT "Bourr";CHR$(130);"e by J.S. Bach"
40 FOR X=1 TO 13:READ A$(X):NEXT X
50 FOR X=1 TO 13:READ B$(X):NEXT X
60 FOR X=1 TO 13:PLAY A$(X),B$(X)
70 FOR DE=1 TO 1000:NEXT DE,X
80 GOTO 60
1000 DATA MBT13503P1P1L8
1010 DATA EF#G4F#ED#4EF#<B4>C#D#E4DC<B4>AG
1020 DATA F#4GABAGF#E4>EF#G4F#ED#4EF#
1030 DATA <B4>C#D#E4DC<B4>AGF#4.GG2.
1040 DATA >EF#G4F#ED#4EF#<B4>C#D#E4DC
1050 DATA <B4>AGF#4GABAGF#E4>EF#G4F#ED#4EF#
1060 DATA <B4>C#D#E4DC<B4>AGF#4.GG2.
1070 DATA BG>D4<A>C<B4>GDE4<B>DC4<BA
1080 DATA G#4AB>C4<BAA2.>D<AB4>GDE4<B>D
1090 DATA C4AEF#4C#ED4C#<BA#4.BB2.>BF#
1100 DATA G#4F#EA4EGF#4EDG4DFE4AEF#4C#E
1110 DATA D#4<B2>E<B>C4D<AB4>C<GA4BF#G4F#E
1120 DATA D#4EF#G4F#EE2.
2000 DATA MBT13501G8F#8L4EABAGF#E
2010 DATA G8F#8EABAGF#EF#GA
2020 DATA BAGBL8EF#GF#L4EABA
2030 DATA GF#EF#G>CD<D>D2.
2040 DATA <G8F#8EABAGF#EF#
2050 DATA GABAGBL8EF#GF#L4EABA
2060 DATA GF#EF#G>CD<D>D2.
2070 DATA <GF#DGB>C<G#A>D
2080 DATA E<A>E<EL8ABAGL4F#DGB>C<G#
2090 DATA A>C#D<A#B>EF#<F#L8BABA>C#L4D#<B
2100 DATA >EDC#<A>D<C>BG>C<BAF#
2110 DATA B4.L8>C<BAG#4A>EF#4<G>D#E4<F#>C#L4D#<EA
2120 DATA BAB2E2.

```

Macintosh/Bourrée

```

DEFINT A-Z:DIM V1(175,2),V2(144,2),WAV(256)
LOCATE 7,29:PRINT "
LOCATE 8,24:PRINT "Bourree by J.S. Bach"
FOR X=-128 TO 127:WAV(X+129)=X:NEXT X
WAVE 0,WAV:WAVE 1,WAV
FOR X=1 TO 175:READ V1(X,1),V1(X,2):NEXT X
FOR X=1 TO 144:READ V2(X,1),V2(X,2):NEXT X
INITIALIZE:
P1=1:P2=1:T1=1:T2=1
SOUNDLOOP:
IF T1=V1(P1,2) THEN SOUND V1(P1,1),4.7,,0:SOUND 0,
.3,,0:T1=1:P1=P1+1 ELSE SOUND V1(P1,1),5,,0:T1=T1+1
IF T2=V2(P2,2) THEN SOUND V2(P2,1),4.7,,1:SOUND 0,
.3,,1:T2=1:P2=P2+1 ELSE SOUND V2(P2,1),5,,1:T2=T2+1
IF P1<176 THEN SOUNDLOOP ELSE FOR DE=1 TO 3000:NEXT
DE:GOTO INITIALIZE
DATA 0,16,659,1,740,1,784,2,740,1,659,1,622,2

```

```

DATA 659,1,740,1,494,2,554,1,622,1,659,2,587,1
DATA 523,1,494,2,440,1,392,1,370,2,392,1,440,1
DATA 494,1,440,1,392,1,370,1,330,2,659,1,740,1
DATA 784,2,740,1,659,1,622,2,659,1,740,1,494,2
DATA 554,1,622,1,659,2,587,1,523,1,494,2,440,1
DATA 392,1,370,3,392,1,392,6,659,1,740,1,784,2
DATA 740,1,659,1,622,2,659,1,740,1,494,2,554,1
DATA 622,1,659,2,587,1,523,1,494,2,440,1,392,1
DATA 370,2,392,1,440,1,494,1,440,1,392,1,370,1
DATA 330,2,659,1,740,1,784,2,740,1,659,1,622,2
DATA 659,1,740,1,494,2,554,1,622,1,659,2,587,1
DATA 523,1,494,2,440,1,392,1,370,3,392,1,392,6
DATA 494,1,392,1,587,2,440,1,523,1,494,2,784,1
DATA 587,1,659,2,494,1,587,1,523,2,494,1,440,1
DATA 415,2,440,1,494,2,554,1,622,2,494,1,440,6
DATA 587,1,440,1,494,2,784,1,587,1,659,2,494,1
DATA 587,1,523,2,880,1,659,1,740,2,554,1,659,1
DATA 587,2,554,1,494,1,466,3,494,1,494,6,988,1
DATA 740,1,831,2,740,1,659,1,880,2,659,1,784,1
DATA 740,2,659,1,587,1,784,2,587,1,698,1,659,2
DATA 880,1,659,1,740,2,554,1,659,1,622,2,494,4
DATA 659,1,494,1,523,2,587,1,440,1,494,2,523,1
DATA 392,1,440,2,494,1,370,1,392,2,370,1,330,1
DATA 311,2,330,1,370,1,392,2,370,1,330,1,330,6
DATA 196,1,185,1,165,2,220,2,247,2,220,2,196,2
DATA 185,2,165,2,196,1,185,1,165,2,220,2,247,2
DATA 220,2,196,2,185,2,165,2,196,2,196,2,220,2
DATA 247,2,220,2,196,2,247,2,165,1,185,1,196,1
DATA 185,1,165,2,220,2,247,2,220,2,196,2,185,2
DATA 165,2,185,2,196,2,262,2,294,2,147,2,247,6
DATA 196,1,185,1,165,2,220,2,247,2,220,2,196,2
DATA 185,2,165,2,185,2,196,2,220,2,247,2,220,2
DATA 196,2,247,2,165,1,185,1,196,1,185,1,165,2
DATA 220,2,247,2,220,2,196,2,185,2,165,2,185,2
DATA 196,2,262,2,294,2,147,2,247,6,196,2,185,2
DATA 147,2,196,2,247,2,262,2,208,2,220,2,294,2
DATA 330,2,220,2,330,2,165,2,220,1,247,1,220,1
DATA 196,1,185,2,147,2,196,2,247,2,262,2,208,2
DATA 220,2,277,2,294,2,233,2,247,2,330,2,370,2
DATA 185,2,247,1,233,1,247,1,277,1,311,2,247,2
DATA 330,2,294,2,277,2,220,2,294,2,262,2,247,2
DATA 196,2,262,2,247,2,220,2,185,2,247,3,262,1
DATA 247,1,220,1,208,2,220,1,330,1,370,2,196,1
DATA 311,1,330,2,185,1,277,1,311,2,165,2,220,2
DATA 247,2,220,2,247,4,165,6

```

FYI**GETTING THE MOST FROM DOS**

Do you want to learn how to get the most from DOS? Pick up a copy of *Peter Norton's DOS Guide, Revised & Expanded*. The author, a well-known computer writer and programmer, gives practical advice based on his personal experiences with DOS. By mastering DOS commands, you will be able to work with your computer more quickly and efficiently. The book also gives you information on choosing wisely among commercial software packages. The easy-to-read *Peter Norton's DOS Guide, Revised & Expanded* is published by Brady Books ((800) 223-2336) and is available for \$20.

TAKE GOOD CARE OF YOUR PC

A useful and worthwhile book that will help you gain more control over your computer's health is *PC Care Manual: Diagnosing and Maintaining Your MS-DOS, CP/M or Macintosh System*, by Chris Morrison and Teresa S. Stover. You don't need any experience in electronics, computer programming, or repair for this book to be useful. Each chapter specializes on a particular part of your computer system and offers preventive-maintenance procedures and general repair guidelines if a problem is diagnosed. The book even provides a listing of a System Diagnostics Program to help troubleshoot any problems you may encounter. This easy-to-follow, money-saving maintenance book is available from Tab Books Inc. (Blue Ridge Summit, PA 17294; (800) 233-1128) for \$17 (soft cover) or \$25 (hard cover).

FYI

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A HELP LINE FOR PROGRAM PROBLEMS

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PROGRAMMING P.S.

Information About Previous Months' Programs

Shapes and Colors (February 1988, page 89)

Apple II series: Please change line 490 to read as follows:
490 PRINT K\$;TL = TL+1:IF IN = NM THEN 510

Sketch (April 1988, page 78)

Apple II series: Because of the way the Apple II series of computers handles the high-resolution screen, using the colors BLACK2, ORANGE, BLUE, or WHITE2 on a GREEN or PURPLE background, or using BLACK, GREEN, PURPLE, or WHITE on an ORANGE or BLUE background, will produce a 'bleed' of color complementary to the drawing color. Experiment with different methods of maneuvering around this. For example, start with a WHITE background. FILL the screen with another color, and then begin to draw. Also, see if you can TOUCH UP the places where the colors have bled.

Word Search (March 1988, page 89)

Commodore 64 & 128: Due to a renumbering error, lines 5100 and 5105 are incorrect. Delete line 5105 and change line 5100 to read as follows:

5100 K=ASC(K\$):IF K<>17 AND K<>29 AND K<>145 AND K<>157 THEN 5000

ATTENTION ALL PC-DOS USERS...


Using PC DOS, 2nd Edition, by Chris DeVoney, is an impressive reference book for DOS users at all levels. Beginners will enjoy its clear and comprehensive approach to basic DOS commands, while experienced users will find helpful tricks for customizing DOS. The step-by-step organization of this book makes it easy to find any information you're looking for. The book covers DOS versions 3.0 through 3.3; any differences between version 2 and version 3 are mentioned in the relevant chapters. *Using PC DOS, 2nd Edition* is an informative book that will be a lasting reference for all DOS users. The book is available from Que Corporation ([800] 428-5331) for \$22.95.

INTRODUCING THE MAC FAMILY...

Technical Introduction to the Macintosh Family is a noteworthy book from Apple Computer, Inc., that is written for both the experienced user and the novice programmer. The book logically explains the features and specifications of the Macintosh family of computers. It is geared toward the Macintosh Plus/SE/II computers, but mentions some earlier versions of the Macintosh. This book is a suitable starting point for new programmers and also serves as a reliable reference book for advanced Macintosh users. A companion volume, *Programmer's Introduction to the Macintosh Family* (\$22.07), recently became available. *Technical Introduction to the Macintosh Family* is available from Addison-Wesley (1 Jacob Way, Reading, MA 01867; [617] 944-3700) for \$19.18.

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CIRCLE READER SERVICE 28

MAY 1988 91

THE SYSTEMS WE TEST ON

Every FAMILY & HOME-OFFICE COMPUTING program is thoroughly tested before publication. The exact systems we use during the testing process are listed here. While you can be sure that a program will work if your system matches ours, a comparable system configuration should also work. For example, even though we do not test on the Franklin Ace, Apple programs should work on this system. Any exception to the following hardware and software configurations will be listed in the chart on page 77. Systems that do not have specific printers listed were tested with Epson FX-80 printers when printer options were available.

Apple IIe in 40-column mode w/64K RAM, DOS 3.3, two disk drives, MPC parallel printer interface, monochrome and color monitors. Apple programs should also work on Apple IIc/II Plus and under ProDOS. **Apple IIcs** w/1MB RAM, one 3.5-inch and one 5.25-inch disk drive, ProDOS 3.3, and Apple RGB monitor. **Atari 800XL** w/two disk drives, DOS 2 version 2.05, Atari 850 interface, and color monitor. Atari programs should also work on Atari 800 (w/48K), 1200XL, and 65/130XE. Smaller programs should work on Atari 400 and 600XL. Programs will not work on the Atari XE Video Game System. **Commodore 128** in C 64 mode with two 1571 disk drives, color monitor, and Micro-graphics parallel graphics interface. Programs should also work on Commodore 64/64C/128D. **IBM PC** w/640K RAM, Disk BASIC D2.00, IBM Monochrome Display and Printer Adapter, monochrome monitor, IBM Color/Graphics Monitor Adapter, RGB monitor, AST Sixpack Plus, and IBM PC DOS 3.10. **IBM PCjr** w/128K RAM, one disk drive, IBM PC DOS 2.10, Cartridge BASIC J1.00. **IBM PS/2 Model 30** w/640K RAM, one floppy-disk and one hard-disk drive, RGB monitor, IBM PC DOS 3.30, and IBM PC BASIC A3.30. Programs should also work on the PS/2 Model 25. **Macintosh** w/512K RAM, two disk drives, Microsoft BASIC 2.1, and ImageWriter printer. Macintosh programs should also work on 128K Mac/Mac Plus/SE/II and under Microsoft BASIC 2.0.

Tandy Color Computer 2 w/64K RAM, Disk Extended Color BASIC 1.1, two disk drives, Botek serial-to-parallel printer interface, color monitor. Programs should also work on Color Computer 1 (w/64K) and 3.

The following PC compatibles have been added to our testing list. IBM PC programs should also work on other PC compatibles with at least 128K.

Blue Chip w/512K RAM, two disk drives, monochrome monitor, MS-DOS 3.20, GW-BASIC 3.20. **Commodore PC-10** w/640K RAM, two disk drives, monochrome monitor, MS-DOS 3.20, GW-BASIC 3.20. **Epson Equity I** w/256K RAM, two disk drives, monochrome display adapter, monochrome monitor, MS-DOS 3.10, GW-BASIC 3.10. Programs should also work on the Epson Equity I Plus, II, III, III Plus. **Kaypro PC 10** w/640K RAM, two disk drives, RGB monitor, MS-DOS 2.11, GW-BASIC 2.02. **Leading Edge Model D** w/640K RAM, two disk drives, monochrome and RGB monitors, MS-DOS 3.10, GW-BASIC 3.11. Programs should also run on the Leading Edge Model D2. **Panasonic FX-600** w/640K RAM, two disk drives, MS-DOS 3.10, Panasonic Personal Computer BASIC 3.11, enhanced graphics adapter, RGB monitor. **Tandy 1000 EX** w/256K RAM, two disk drives, MS-DOS 2.11 version 02.11.24, GW-BASIC 2.02 version 01.02.00, RGB monitor. **Tandy 1000 HX** w/256K RAM, one disk drive, MS-DOS 2.11 version 02.11.26, GW-BASIC 2.02 version 01.02.01, RGB monitor. **Tandy 1000 SX** w/384K RAM, two disk drives, MS-DOS 3.20 version 03.20.00, GW-BASIC 3.20 version 03.20.00, RGB monitor. **Tandy 1000 TX** w/640K RAM, one disk drive, MS-DOS 3.20 version 03.20.21, GW-BASIC 3.20 version 03.20.01, RGB monitor. IBM PCjr programs should also work on the Tandy 1000. If you have a Tandy 1400LT, 3000, or 4000, use the IBM PC and compatibles' version rather than the IBM PCjr and compatibles' version. **Vendex HeadStart Turbo 888-XT** w/640K RAM, two disk drives, MS-DOS 3.20, GW-BASIC 3.20, RGB monitor. **Zenith Z148PC** w/640K RAM, two disk drives, MS-DOS 3.10, GW-BASIC 3.20, RGB monitor.

TIPS TO THE TYPIST

SOME GENERAL RULES

1. Read instructions and program headings carefully.
2. Don't let fatigue and boredom contribute to inaccuracy. If you're new to programming, type in a longer program in easy stages, saving each installment as you go.
3. Assume that every character in a program listing must be copied accurately if a program is to work.
4. Watch out for potential trouble spots. About 90 percent of all typing errors occur in DATA statements.
5. Be aware that our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press RETURN or ENTER before checking to see if the program "line" you're typing really ends there.
6. To correct an error in a BASIC program line, type the line in again from the beginning, and press RETURN or ENTER to replace the old line.

WHICH PROGRAM WILL RUN ON MY COMPUTER?

- IBM compatibility of BASIC programs is determined by both the hardware and the version of BASIC used. Our programs for IBM PC and compatibles are composed on IBM PCs and PCjrs, and are tested under most versions of BASIC available for these machines. Each "IBM PC and compatibles" program is also tested on a number of compatibles. For a rundown of the machines and versions of BASIC under which the program is guaranteed to work, see the chart at the beginning of *The Programmer*.

DEBUGGING HINTS

1. Write down any error messages you receive.
2. Look up error messages in your manual, and check the indicated lines for simple mistakes. Also check related lines, such as the DATA statements corresponding to a READ routine. Correct all the problems you can find, and save a corrected copy of the program before typing RUN again.
3. LIST the program in screen-size chunks (check your manual for instructions on how to LIST parts of a program) or get a printout. Compare what you've typed in—letter by letter—to the published program. Make sure that you haven't dropped or mixed up some punctuation, switched uppercase text for lowercase, or vice versa, or miscounted the characters (and/or spaces) between a pair of quotes.
4. Mistakes in DATA statements are the single most common cause of program failures. If you can't find your error in the lines the computer specifies, check your DATA statements line by line, letter by letter, comma by comma.
5. If all else fails, turn off your computer and relax. Then try again the next day—exhausted proofreaders are careless proofreaders.

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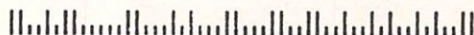
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